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CENTERS FOR DISEASE CONTROL  
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**CDC**  
*Surveillance*  
*Summaries*

## **Special Focus:** **Surveillance for Reproductive Health**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
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AIDS/HIV		
Distribution by Racial/Ethnic Group	NCID	1988; Vol. 37, No. SS-3
Among Black & Hispanic Children &		
Women of Childbearing Age	NCEHIC	1990; Vol. 39, No. SS-3
Behavioral Risk Factors	NCCDPHP	1991; Vol. 40, No. SS-4
Birth Defects		
B.D. Monitoring Program (see also Malformations)	NCEH	1993; Vol. 42, No. SS-1
Contribution of B.D. to Infant Mortality		
Among Minority Groups	NCEHIC	1990; Vol. 39, No. SS-3
Breast & Cervical Cancer	NCCDPHP	1992; Vol. 41, No. SS-2
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Chancroid	NCPS	1992; Vol. 41, No. SS-3
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Congenital Malformations, Minority Groups	NCEHIC	1988; Vol. 37, No. SS-3
Contraception Practices	NCCDPHP	1992; Vol. 41, No. SS-4
Cytomegalovirus Disease, Congenital	NCID	1992; Vol. 41, No. SS-2
Dengue	NCID	1985; Vol. 34, No. 2SS
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Motor Vehicle-Related Deaths	NCEHIC	1988; Vol. 37, No. SS-1
Objectives of Injury Control, State & Local	NCEHIC	1988; Vol. 37, No. SS-1

#### Abbreviations\*

NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCEH	National Center for Environmental Health
NCEHIC	National Center for Environmental Health and Injury Control
NCID	National Center for Infectious Diseases
NCIPC	National Center for Injury Prevention and Control
CIO	Centers/Institute/Offices
NCPS	National Center for Prevention Services
IHPO	International Health Program Office
EPO	Epidemiology Program Office
NIOSH	National Institute for Occupational Safety and Health

## Most Recent Reports Published in CDC Surveillance Summaries — Continued

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Objectives of Injury Control, National	NCEHIC	1988; Vol. 37, No. SS-1
Residential Fires, Deaths	NCEHIC	1988; Vol. 37, No. SS-1
Tap Water Scalds	NCEHIC	1988; Vol. 37, No. SS-1
Lead Poisoning, Childhood	NCEHIC	1990; Vol. 39, No. SS-4
Low Birth Weight	NCCDPHP	1990; Vol. 39, No. SS-3
Malaria, Imported	NCID	1983; Vol. 32, No. 3SS
Malformations (see also Birth Defects)	NCEHIC	1985; Vol. 34, No. 2SS
Maternal Mortality	NCCDPHP	1991; Vol. 40, No. SS-2
Measles	NCPS	1992; Vol. 41, No. SS-6
Meningococcal Disease	NCID	1993; Vol. 42, No. SS-2
Mining (see also Coal Workers' Health)	NIOSH	1986; Vol. 35, No. 2SS
National Infant Mortality (see also Infant Mortality; Birth Defects)	NCCDPHP	1989; Vol. 38, No. SS-3
<i>Neisseria gonorrhoeae</i> , Antimicrobial Resistance in Nosocomial Infection	NCPS	1993; Vol. 42, No. SS-3
Occupational Injuries/Disease	NCID	1986; Vol. 35, No. 1SS
Among Loggers	NIOSH	1983; Vol. 32, No. 3SS
Hazards, Occupational	NIOSH	1985; Vol. 34, No. 2SS
In Meatpacking Industry	NIOSH	1985; Vol. 34, No. 1SS
Silicosis	NIOSH	1993; Vol. 42, No. SS-5
State Activities	NIOSH	1987; Vol. 36, No. SS-2
Treated in Hospital Emergency Rooms	NIOSH	1983; Vol. 32, No. 2SS
Ovarian Cancer (see Endometrial & Ovarian Cancers)	EPO, NCCDPHP	1986; Vol. 35, No. 2SS
Parasites, Intestinal	NCID	1991; Vol. 40, No. SS-4
Pediatric Nutrition	NCCDPHP	1992; Vol. 41, No. SS-7
Pelvic Inflammatory Disease	NCPS	1983; Vol. 32, No. 4SS
Pertussis	NCPS	1992; Vol. 41, No. SS-8
Plague	NCID	1985; Vol. 34, No. 2SS
Plague, American Indians	NCID	1988; Vol. 37, No. SS-3
Pneumoconiosis, Coal Miners	NIOSH	1983; Vol. 32, No. 1SS
Poliomyelitis	NCPS	1992; Vol. 41, No. SS-1
Postneonatal Mortality	NCCDPHP	1991; Vol. 40, No. SS-2
Pregnancy Nutrition	NCCDPHP	1992; Vol. 41, No. SS-7
Pregnancy, Teenage	NCCDPHP	1993; Vol. 42, No. SS-6
Psittacosis	NCID	1983; Vol. 32, No. 1SS
Rabies	NCID	1989; Vol. 38, No. SS-1
Racial/Ethnic Minority Groups	Various	1990; Vol. 39, No. SS-3
Respiratory Disease	NCEHIC	1992; Vol. 41, No. SS-4
Reye Syndrome	NCID	1984; Vol. 33, No. 3SS
Rocky Mountain Spotted Fever	NCID	1984; Vol. 33, No. 3SS
Rotavirus	NCID	1992; Vol. 41, No. SS-3
Rubella & Congenital Rubella	NCPS	1984; Vol. 33, No. 4SS
<i>Salmonella</i>	NCID	1988; Vol. 37, No. SS-2
Sexually Transmitted Diseases in Italy	NCPS	1992; Vol. 41, No. SS-1
Smoking	NCCDPHP	1990; Vol. 39, No. SS-3
Streptococcal Disease (Group B)	NCID	1992; Vol. 41, No. SS-6
Sudden Unexplained Death Syndrome Among Southeast Asian Refugees	NCEHIC, NCPS	1987; Vol. 36, No. 1SS
Suicides, Persons 15–24 Years of Age	NCEHIC	1988; Vol. 37, No. SS-1
Summer Mortality	NCEHIC	1983; Vol. 32, No. 1SS
Syphilis, Congenital	NCPS	1993; Vol. 42, No. SS-6
Syphilis, Primary & Secondary	NCPS	1993; Vol. 42, No. SS-3
Tetanus	NCPS	1992; Vol. 41, No. SS-8
Toxic-Shock Syndrome	NCID	1984; Vol. 33, No. 3SS
Trichinosis	NCID	1991; Vol. 40, No. SS-3
Tubal Sterilization Among Women	NCCDPHP	1983; Vol. 32, No. 3SS
Tuberculosis	NCPS	1991; Vol. 40, No. SS-3
Waterborne Disease Outbreaks	NCID	1993; Vol. 42, No. SS-5
Years of Potential Life Lost	EPO	1992; Vol. 41, No. SS-6



## Foreword

One million teenagers became pregnant in 1990; over half of these young women gave birth. After some success in reducing teen pregnancy in the early 1980s, teen pregnancy and birth rates are increasing. Today, a teenager in America is more likely than ever to become pregnant or to become a young mother.

This is a problem, as many teenage mothers are ill equipped to handle pregnancy or raise a child. Of special concern are young teens whose children are more likely to be of low birth weight or have other complications affecting their long-term growth and development.

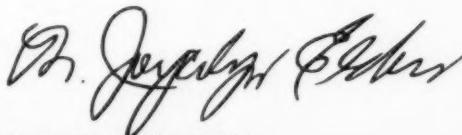
Almost 200,000 young teenagers ages 15–17 years gave birth in 1990, and, as indicated in a companion report, many others had abortions. These teenagers are not yet prepared for the rest of their life—how can they be prepared for parenting? They haven't finished their education, and many will not be able to do so if they become mothers. The medical, social, and economic impact of the pregnancies places an enormous burden on teenagers, their families, and society.

This special surveillance report examines the patterns of teen pregnancy and birth across the country. There are substantial differences in these patterns by state, and they have been explained to some degree. The report also examines how these differences can be magnified by differences in race and ethnicity.

Pregnancy rates in some states were double those in other states; birth rates tripled from one state to another; and there was an eightfold difference in the abortion rate when data were compared from the state with the lowest rate to that with the highest. In the state with the highest rate of pregnancy for black teenagers, one-fifth of 15- to 19-year-old black women were pregnant in 1990. Birth rates for white teenagers have been shown to be three times as high in some states as in others.

As public health practitioners at the national, state, and local levels, we need this type of detailed information to target our prevention strategies. Not all young women in all areas experience an equal risk. Many factors enable some young women to avoid an unplanned pregnancy in their teenage years. Some of these factors include self-esteem, the interpersonal skills to resist early initiation of sexual activity, appropriate and adequate health education, and access to family planning services and counseling.

The teenage years are a time of personal discovery and fulfillment. They are not years well-suited to the nurturing of a future generation. We must make it possible for every teenager to prevent a pregnancy until that personal decision is a responsible and appropriate one and in the best interest of all involved.



M. Joycelyn Elders, M.D.  
Surgeon General



## Surveillance for Pregnancy and Birth Rates Among Teenagers, by State — United States, 1980 and 1990

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### Abstract

**Problem/Condition:** In the United States in 1990, there were an estimated 1 million pregnancies and 521,826 births among women ages 15–19 years. Rates of teenage pregnancy and birth rates by state in 1990 exceeded those in most developed countries. An estimated 95% of teenage pregnancies are unintended (i.e., they occur sooner than desired or are not wanted at any time).

**Reporting Period Covered:** This report summarizes and reviews surveillance data for pregnancies, abortions, and births among women ages 15–19, 15–17, and 18–19 years reported by CDC for 1980 and 1990.

**Description of System:** Data for births and abortions were reported to state health departments and other health agencies and sent to CDC. The data from each state included the total number of births and abortions by age and race/ethnicity.

**Results:** Data in this report indicate that pregnancy rates by state among U.S. teenagers ages 15–19 years have changed little since 1980. Moreover, many states have reported increases in birth rates that are probably related to concurrent decreases in abortion rates. Pregnancy rates range from 25 to 75 per 1,000 for 15- to 17-year-olds and from 92 to 165 per 1,000 for 18- to 19-year-olds.

**Interpretation:** States with low rates of teenage pregnancy or birth may have developed and used prevention strategies directed at the needs of both younger and older teenagers; these programs may serve as models for other states where birth rates have remained high or have increased since 1980.

**Actions Taken:** CDC will continue to conduct surveillance of and analyze data for pregnancies, abortions, and births among teenagers to monitor progress toward national goals and to assist in targeting program efforts for reducing teenage pregnancy.

## INTRODUCTION

An estimated 1 million pregnancies and 521,826 live births among U.S. women ages 15–19 years were reported for 1990 (1,2). Because of the adverse health, social, and economic consequences of teenage childbearing, CDC analyzed data for pregnancies and births among teenagers (3). These data will be used to monitor progress toward national goals and to assist in targeting program efforts to reduce teenage pregnancy (4). An earlier report presented 1990 pregnancy and birth rates for teenagers ages 15–19 by state and race/ethnicity and compared those rates with those for 1980 (5); this report makes the same comparisons with more detailed age groups for the 15- through 19-year-old population (6,7). Data for teenagers <15 years of age will be presented in a future report.

## METHODS

For this report, rates of teenage pregnancy were defined as the sum of live births and legal induced abortions per 1,000 women ages 15–19, 15–17, and 18–19 years; rates were also analyzed by racial/ethnic group. These rates do not include estimates of spontaneous abortions or stillbirths, primarily because fetal losses are substantially underreported to state health departments. Although national estimates indicate that approximately 12% of pregnancies among U.S. teenagers end in fetal loss (2), no comparable data are available at the state level.

Birth rates among teenagers were defined as the number of live births per 1,000 women ages 15–19, 15–17, and 18–19 years in their respective racial/ethnic group. Abortion rates were defined as the number of legal induced abortions per 1,000 women in those age and racial/ethnic groups. Information about births was obtained from birth certificates; state reports to CDC provided information on abortions. Numbers of women used to calculate rates were obtained from unpublished tabulations provided by the U.S. Bureau of the Census. Births were reported by state of residence; since abortion data by residence were not available for all states, abortions were reported by state of occurrence. Thus, pregnancy and abortion rates for states with substantial numbers of abortions among nonresident women may be somewhat higher than rates based on abortions by residence.

Because the numbers of abortions by age were not available for all states in 1990, pregnancy rates for all women ages 15–19 years in 1990 were calculated for the District of Columbia (DC) and for the 40 states from which information for age was available.\* Pregnancy rates for detailed age groups and for race/ethnicity were calculated for states reporting data by those categories. Birth rates were calculated for all 50 states and DC for all three age groups. Detailed information has been tabulated on the states reporting data for abortions and births by various age and racial/ethnic categories (Appendix).

Rates by race/ethnicity were not reported if there were ≤20 abortions or births or ≤1,000 women in the specified group or if ≥15% of abortions were among women of unknown race/ethnicity. These exclusions are noted in the tables.<sup>†</sup> Furthermore, rates

\*For states with <15% unknown information on age or race, unknowns were redistributed based on known distributions. Thus, many numbers and rates that resulted from these redistributions differ slightly from those published in recent reports (5,9).

<sup>†</sup>When rates are not reported, the reason for their exclusion is listed in the table according to the following hierarchy: a) abortion data not available; b) ≤20 births or abortions or ≤1,000 women; and c) ≥15% unknown race/ethnicity in abortion data.

for racial/ethnic groups other than white, black, and Hispanic were not calculated because abortion data were not available or because the numbers of births were too small at the state level for reliable rates to be computed. Data analyzed by race/ethnicity may be useful for targeting educational and family planning programs for reducing pregnancy among teenagers.

Hispanic women and infants born to Hispanic women may be of any race. Although both race and Hispanic origin were reported separately on 1990 state birth certificates and in the census, information for abortions in 1990 (reported by states to CDC) did not designate race independently of Hispanic ethnicity. Thus, for this analysis, pregnancy and abortion rates for whites include all abortions for Hispanics.\* For most states, rates will be affected minimally because the majority of states have small numbers of Hispanic women. However, for states with relatively large Hispanic populations, such as Texas, the rate for white women may reflect to a considerable degree the rate for Hispanics.

Differences mentioned in the text in rates in 1990 compared with 1980 are statistically significant at the 0.05 level. The categories of percent changes in rates from 1980 to 1990 are based on rounded numbers.

## RESULTS

### Rates of Pregnancy, Abortion, and Birth by Age Group

In 1990, pregnancy rates by state among women ages 15–19 years ranged from 56 to 111 per 1,000 women<sup>†</sup> (Table 1). Rates for the younger teenagers in this age group (15–17 years) showed proportionately greater variation, ranging from 25 to 75 per 1,000. Rates for older teenagers (18–19 years) were much higher than those for younger teenagers, ranging from 92 to 165 per 1,000.

Abortion rates reported by states<sup>†</sup> for women ages 15–19 years varied more than pregnancy rates, ranging from 6 to 49 abortions per 1,000 women (Table 2). Rates for women ages 15–17 ranged from 3 to 34 per 1,000, while abortion rates for women ages 18–19 ranged from 10 to 68 per 1,000 (Table 2).

Birth rates among women ages 15–19 years ranged from 33 to 81 per 1,000 women<sup>†</sup> (Table 3). For young teenagers ages 15–17, rates ranged from 16 to 57 per 1,000 women. Again, rates for older teenagers were higher than those for younger teenagers, ranging from 47 to 124 per 1,000 women ages 18–19.

### Rates of Pregnancy, Abortion, and Birth by Race/Ethnicity

Pregnancy and birth rates for blacks were generally higher than rates for Hispanics and whites (Tables 4 and 5). However, data were not available to permit adjustments for socioeconomic or educational status of mothers. Pregnancy rates for teenagers ages 15–19 years ranged from 104 to 219 per 1,000 for blacks in the 24 states for which rates could be calculated; from 56 to 145 per 1,000 for Hispanics (19 states); and from 46 to 106 per 1,000 for whites (30 states).

In 1990, pregnancy rates for black teenagers ages 15–17 years were generally 2 to 3 times the rates for white teenagers in that age group (Table 4). Rates for Hispanic

\*Ninety-seven percent of Hispanic women who had a live birth in 1990 were white (1).

<sup>†</sup>DC is not included in these comparisons. Its pregnancy and abortion rates were higher than those of any state, in part because large numbers of nonresidents had abortions there in 1980 and 1990.

**TABLE 1. Number of pregnancies\* and pregnancy rates† for 15- to 19-year-olds, by age group and state — United States, 1990**

State	Number of pregnancies			Pregnancy rates			
	Age group (yrs)	15-19	15-17	18-19	Age group (yrs)	15-19	15-17
Alabama	\$	\$	\$	\$	\$	\$	\$
Alaska	\$	\$	\$	\$	\$	\$	\$
Arizona	12,961	4,583	8,378	101.8	63.7	151.4	
Arkansas	8,614	3,057	5,557	98.4	60.4	150.3	
California	\$	\$	\$	\$	\$	\$	\$
Colorado	9,010	3,351	5,659	82.3	53.8	119.8	
Connecticut	\$	\$	\$	\$	\$	\$	\$
Delaware	\$	\$	\$	\$	\$	\$	\$
District of Columbia	5,566	\$	\$	255.2	\$	\$	\$
Florida	\$	\$	\$	\$	\$	\$	\$
Georgia	26,963	10,275	16,688	110.8	74.8	157.5	
Hawaii	3,059	1,085	1,974	88.2	53.3	137.8	
Idaho	2,334	737	1,597	58.8	31.8	96.8	
Illinois	\$	\$	\$	\$	\$	\$	\$
Indiana	15,648	5,144	10,504	74.3	43.9	112.4	
Iowa	\$	\$	\$	\$	\$	\$	\$
Kansas	6,825	2,379	4,446	81.1	49.8	122.1	
Kentucky	12,583	4,573	8,010	91.0	58.2	134.3	
Louisiana	15,214	5,551	9,663	92.1	59.1	135.6	
Maine	2,953	1,016	1,937	68.4	41.5	103.5	
Maryland	12,953	4,728	8,225	84.7	55.2	122.2	
Massachusetts	14,705	4,766	9,939	71.1	45.2	98.0	
Michigan	29,313	10,523	18,790	85.2	54.1	125.4	
Minnesota	9,127	2,974	6,153	62.0	35.8	96.0	
Mississippi	10,758	4,346	6,412	97.8	70.5	132.7	
Missouri	14,755	5,054	9,701	82.6	50.3	123.8	
Montana	2,245	770	1,475	81.7	46.3	135.8	
Nebraska	4,124	1,395	2,729	74.2	44.0	114.3	
Nevada	3,906	1,366	2,540	107.5	65.3	164.8	
New Hampshire	\$	\$	\$	\$	\$	\$	\$
New Jersey	18,704	6,715	11,989	75.3	46.9	113.8	
New Mexico	5,612	2,062	3,550	100.4	62.0	157.1	
New York	56,677	20,698	35,979	92.9	61.5	131.5	
North Carolina	25,979	9,665	16,314	106.4	73.0	145.9	
North Dakota	1,265	320	945	56.4	24.8	99.5	
Ohio	29,182	9,643	19,539	74.5	43.8	113.7	
Oklahoma	\$	\$	\$	\$	\$	\$	\$
Oregon	8,301	2,952	5,349	89.2	54.6	137.3	
Pennsylvania	30,268	10,787	19,481	74.6	48.6	106.1	
Rhode Island	3,124	982	2,142	87.7	56.2	118.0	
South Carolina	12,943	4,723	8,220	95.0	62.7	134.9	
South Dakota	1,425	460	965	56.9	31.6	92.1	
Tennessee	18,199	6,583	11,616	101.8	65.5	148.2	
Texas	65,882	23,765	42,117	102.8	64.5	154.4	
Utah	4,816	1,534	3,282	63.0	34.8	101.4	
Vermont	1,487	509	978	72.1	47.6	98.4	
Virginia	18,567	6,424	12,143	86.5	55.0	124.0	
Washington	15,073	5,267	9,806	95.4	58.3	144.8	
West Virginia	4,673	1,561	3,112	67.4	39.3	105.0	
Wisconsin	11,389	3,832	7,557	66.6	39.9	100.8	
Wyoming	1,042	335	707	62.2	32.7	108.5	

\*The sum of live births and legal induced abortions. Abortions obtained by women of unknown age in each state were distributed according to distribution of known age in that state (for states reporting age).

†Pregnancies per 1,000 women.

<sup>§</sup>Because abortion data were not available, numbers and rates of pregnancies could not be calculated.

**TABLE 2. Number of abortions and abortion rates\* for 15- to 19-year-olds, by age group and state — United States, 1990**

State	Number of abortions			Abortion rates		
	Age group (yrs)			Age group (yrs)		
	15-19	15-17	18-19	15-19	15-17	18-19
Alabama	†	†	†	†	†	†
Alaska	†	†	†	†	†	†
Arizona	3,349	1,147	2,202	26.3	15.9	39.8
Arkansas	1,603	508	1,095	18.3	10.0	29.6
California	†	†	†	†	†	†
Colorado	3,035	1,290	1,745	27.7	20.7	37.0
Connecticut	†	†	†	†	†	†
Delaware	†	†	†	†	†	†
District of Columbia	3,536	†	†	162.1	†	†
Florida	†	†	†	†	†	†
Georgia	8,594	3,397	5,197	35.3	24.7	49.1
Hawaii	937	424	513	27.0	20.8	35.8
Idaho	325	126	199	8.2	5.4	12.1
Illinois	†	†	†	†	†	†
Indiana	3,313	1,014	2,299	15.7	8.7	24.6
Iowa	†	†	†	†	†	†
Kansas	2,103	930	1,173	25.0	19.5	32.2
Kentucky	3,234	1,369	1,865	23.4	17.4	31.3
Louisiana	2,944	898	2,046	17.8	9.6	28.7
Maine	1,096	446	650	25.4	18.2	34.7
Maryland	4,810	1,862	2,948	31.4	21.7	43.8
Massachusetts	7,439	2,264	5,175	36.0	21.5	51.0
Michigan	9,001	3,516	5,485	26.1	18.1	36.6
Minnesota	3,785	1,324	2,461	25.7	15.9	38.4
Mississippi	1,849	802	1,047	16.8	13.0	21.7
Missouri	3,528	1,113	2,415	19.7	11.1	30.8
Montana	914	371	543	33.3	22.3	50.0
Nebraska	1,772	667	1,105	31.9	21.0	46.3
Nevada	1,243	477	766	34.2	22.8	49.7
New Hampshire	†	†	†	†	†	†
New Jersey	8,636	3,221	5,415	34.8	22.5	51.4
New Mexico	1,245	502	743	22.3	15.1	32.9
New York	30,069	11,438	18,631	49.3	34.0	68.1
North Carolina	9,473	3,719	5,754	38.8	28.1	51.4
North Dakota	472	119	353	21.0	9.2	37.2
Ohio	6,492	2,088	4,404	16.6	9.5	25.6
Oklahoma	†	†	†	†	†	†
Oregon	3,217	1,293	1,924	34.6	23.9	49.4
Pennsylvania	12,052	4,490	7,562	29.7	20.2	41.2
Rhode Island	1,560	430	1,130	43.8	24.6	62.2
South Carolina	3,222	1,183	2,039	23.6	15.7	33.5
South Dakota	253	112	141	10.1	7.7	13.5
Tennessee	5,271	2,068	3,203	29.5	20.6	40.9
Texas	17,580	6,072	11,508	27.4	16.5	42.2
Utah	1,109	373	736	14.5	8.5	22.7
Vermont	785	300	485	38.0	28.0	48.8
Virginia	7,214	2,678	4,536	33.6	22.9	46.3
Washington	6,676	2,590	4,086	42.2	28.7	60.3
West Virginia	697	248	449	10.0	6.2	15.2
Wisconsin	4,108	1,503	2,605	24.0	15.6	34.8
Wyoming	99	31	68	5.9	3.0	10.4

\*Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age in each state were distributed according to distribution of known age in that state (for states reporting age).

†Because abortion data were not available, rates could not be calculated.

**TABLE 3. Number of births and birth rates\* for 15- to 19-year-olds, by age group and state — United States, 1990**

State	Number of births			Birth rates		
	15-19	15-17	18-19	15-19	15-17	18-19
Alabama	11,252	4,222	7,030	71.0	47.4	101.4
Alaska	1,142	335	807	65.3	31.2	120.0
Arizona	9,612	3,436	6,176	75.5	47.7	111.6
Arkansas	7,011	2,549	4,462	80.1	50.4	120.7
California	69,712	24,880	44,832	70.6	44.6	104.3
Colorado	5,975	2,061	3,914	54.5	33.1	82.9
Connecticut	4,038	1,519	2,519	38.8	26.4	53.9
Delaware	1,277	462	815	54.5	38.4	71.4
District of Columbia	2,030	841	1,189	93.1	88.4	96.7
Florida	27,017	9,918	17,099	69.1	44.9	100.6
Georgia	18,369	6,878	11,491	75.5	50.1	108.5
Hawaii	2,122	661	1,461	61.2	32.5	102.0
Idaho	2,009	611	1,398	50.6	26.3	84.8
Illinois	24,967	9,067	15,900	62.9	40.1	93.3
Indiana	12,335	4,130	8,205	58.6	35.3	87.8
Iowa	3,989	1,120	2,869	40.5	20.4	65.7
Kansas	4,722	1,449	3,273	56.1	30.4	89.9
Kentucky	9,349	3,204	6,145	67.6	40.8	103.0
Louisiana	12,270	4,653	7,617	74.2	49.5	106.9
Maine	1,857	570	1,287	43.0	23.3	68.8
Maryland	8,143	2,866	5,277	53.2	33.5	78.4
Massachusetts	7,266	2,502	4,764	35.1	23.7	47.0
Michigan	20,312	7,007	13,305	59.0	36.0	88.8
Minnesota	5,342	1,650	3,692	36.3	19.9	57.6
Mississippi	8,909	3,544	5,365	81.0	57.5	111.0
Missouri	11,227	3,941	7,286	62.8	39.3	93.0
Montana	1,331	399	932	48.4	24.0	85.8
Nebraska	2,352	728	1,624	42.3	23.0	68.0
Nevada	2,663	889	1,774	73.3	42.5	115.1
New Hampshire	1,258	348	910	33.0	17.1	51.3
New Jersey	10,068	3,494	6,574	40.5	24.4	62.4
New Mexico	4,367	1,560	2,807	78.2	46.9	124.2
New York	26,608	9,260	17,348	43.6	27.5	63.4
North Carolina	16,506	5,946	10,560	67.6	44.9	94.4
North Dakota	793	201	592	35.4	15.6	62.3
Ohio	22,690	7,555	15,135	57.9	34.3	88.1
Oklahoma	7,590	2,528	5,062	66.8	38.8	104.3
Oregon	5,084	1,659	3,425	54.6	30.7	87.9
Pennsylvania	18,216	6,297	11,919	44.9	28.4	64.9
Rhode Island	1,564	552	1,012	43.9	31.6	55.7
South Carolina	9,721	3,540	6,181	71.3	47.0	101.4
South Dakota	1,172	348	824	46.8	23.9	78.7
Tennessee	12,928	4,515	8,413	72.3	45.0	107.3
Texas	48,302	17,693	30,609	75.3	48.0	112.2
Utah	3,707	1,161	2,546	48.5	26.3	78.7
Vermont	702	209	493	34.0	19.5	49.6
Virginia	11,353	3,746	7,607	52.9	32.1	77.7
Washington	8,397	2,677	5,720	53.1	29.6	84.4
West Virginia	3,976	1,313	2,663	57.3	33.0	89.9
Wisconsin	7,281	2,329	4,952	42.6	24.2	66.1
Wyoming	943	304	639	56.3	29.7	98.1

\*Live births per 1,000 women.

teenagers generally were between those for white and black women. These differentials were observed for older teenagers as well.

Abortion rates for black teenagers were generally 1.5 to 3 times the rates for white teenagers, but in some states the rates were similar. Abortion rates for Hispanic teenagers generally were lower than those for either white or black women.

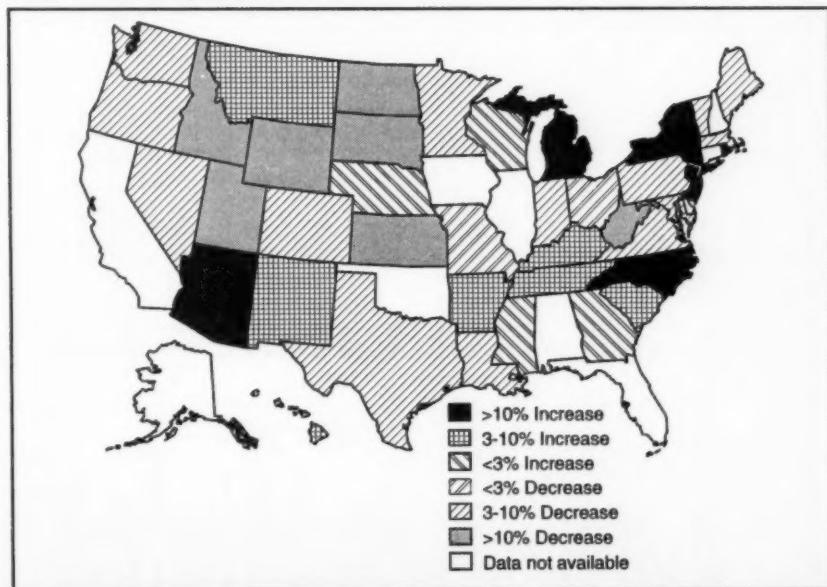
Patterns in birth rates by racial/ethnic group for women ages 15-19 years were similar to patterns in pregnancy rates, although rates for Hispanics were closer to those for blacks. For some states, birth rates for blacks were 2-5 times the rates for whites (Table 5). These patterns were also observed for women ages 15-17 and 18-19.

#### Rates of Pregnancy, Abortion, and Birth by Age Group, 1990 Compared with 1980

For 1990 compared with 1980, pregnancy rates for women ages 15-19 years showed a statistically significant decline in 20 of the 40 states and in DC (Table 6 and Figure 1). However, rates in 14 of these 21 areas declined by  $\leq 10\%$ . Over the decade, pregnancy rates increased in 13 states, and six of these states reported increases  $> 10\%$ .

Pregnancy rates for teenagers ages 15-17 years declined in 18 of the 40 states for which rates were computed (Table 7). Trends in rates for teenagers ages 18-19 were remarkably similar to those for the younger teenagers, except that the range of the percent changes was smaller for the older teenagers (Table 8).

FIGURE 1. Percent change in pregnancy rates for women ages 15-19 years — United States,\* 1990 compared with 1980



\*The percent change was not statistically significant in Maine, Mississippi, Missouri, Montana, Nebraska, Ohio, and Wisconsin.

TABLE 4. Pregnancy rates\* for 15- to 19-year-olds, by age group, race/ethnicity,<sup>†</sup> and state — United States, 1990

State	Age group (yrs)					
	15-19		15-17		18-19	
	White <sup>‡</sup>	Black	Hispanic <sup>‡</sup>	White	Black	Hispanic
Alabama	§	§	§	§	§	§
Alaska	99.9	153.5	145.0	62.5	105.3	147.8
Arizona	82.7	157.2	5	45.6	114.1	132.6
Arkansas	§	§	§	§	§	§
California	**	**	**	**	**	**
Colorado	§	§	§	§	§	§
Connecticut	§	§	§	§	§	§
Delaware	§	§	§	§	§	§
District of Columbia	§	§	§	§	§	§
Florida	§	§	§	§	§	§
Georgia	86.2	162.5	87.5	54.0	117.8	56.0
Hawaii	**	**	**	**	**	**
Idaho	58.6	126.0	31.4	1	79.0	96.7
Illinois	§	§	§	§	§	§
Indiana	65.5	158.0	76.4	36.3	112.1	**
Iowa	§	§	§	§	§	§
Kansas	74.5	181.1	99.3	44.5	127.2	60.4
Kentucky	84.3	164.1	52.3	122.6	113.8	252.2
Louisiana	68.7	128.8 <sup>††</sup>	1	37.6	92.3 <sup>††</sup>	102.2
Maine	67.6	1	1	41.2	1	102.2
Maryland	61.5	141.8	1	36.8	100.8	1
Massachusetts	§	§	§	§	§	§
Michigan	56.3	219.4	89.9	30.7	151.9	48.4
Minnesota	71.6	130.5	46.6	99.2	102.2	102.2
Mississippi	64.8	197.5	57.0	35.2	145.0	34.3
Missouri	**	**	**	**	**	**
Montana	§	§	§	§	§	§
Nebraska	105.8	156.8	112.8	62.5	109.4	71.1
New Hampshire	§	§	§	§	§	§
New Jersey	52.7	181.6	115.1	30.4	127.5	83.2
New Mexico	99.6	115.5	122.2	61.5	79.1	154.9
New York	76.3	166.4	136.8	47.6	119.5	110.9
North Carolina	86.3	157.3	1	56.6	113.5	1
North Dakota	50.4	1	1	21.0	1	90.3

TABLE 4. Pregnancy rates\* for 15- to 19-year-olds, by age group, race/ethnicity,<sup>†</sup> and state—United States, 1990—Continued

State	Age group (yrs)					
	15-19	Black	Hispanic <sup>‡</sup>	White	Black	Hispanic
Ohio	60.5	170.1	83.2	32.9	117.8	55.2
Oklahoma	5	5	5	5	5	5
Oregon	89.7	178.0	134.3	53.5	127.2	89.5
Pennsylvania	5	5	5	5	5	5
Rhode Island	80.4	198.9	134.9	50.4	144.3	95.3
South Carolina	76.6	127.0	84.5	46.6	89.3	4
South Dakota	46.0	1	1	24.8	1	74.9
Tennessee	86.3	165.6	56.2	51.5	123.1	5
Texas	99.1	153.6	124.5	58.6	107.5	79.6
Utah	62.2	1	128.7	34.2	1	90.4
Vermont	72.7	1	1	47.9	1	99.5
Virginia	70.4	149.1	74.4	41.7	105.5	46.1
Washington	**	**	**	**	**	**
West Virginia	86.4	103.9	5	38.4	68.8	1
Wisconsin	5	5	5	5	5	5
Wyoming	5	5	5	5	5	5

\* The sum of live births and legal induced abortions per 1,000 women. Abortions obtained by women of unknown age or race/ethnicity in each state were distributed according to distribution of known age or race/ethnicity in that state (for states reporting age or race/ethnicity).

<sup>†</sup> Women of Hispanic origin may be of any race. For calculation of pregnancy rates, abortions for white race included women of Hispanic origin. Six states (Kentucky, Louisiana, Maine, Maryland, North Carolina, and South Dakota) did not report abortion data by Hispanic origin.

<sup>‡</sup> Because abortion data were not available, pregnancy rates could not be calculated.

<sup>\*</sup> Rates not calculated for states with ≤20 births to women in a given age and racial/ethnic group or if there were ≤1,000 women in the age and racial/ethnic group.

<sup>\*\*</sup> Rates not calculated because ≥15% of abortions were obtained by women of unknown age or race/ethnicity.

<sup>††</sup> Rates for all races other than white.

TABLE 5. Birth rates\* for 15- to 19-year-olds, by age group, race/ethnicity,<sup>†</sup> and state — United States, 1990

State	Age group (yrs)					
	15-19		15-17		18-19	
	White	Black	Hispanic <sup>†</sup>	White	Black	Hispanic
Alabama	55.3	105.3	33.8	33.3	76.8	82.9
Alaska	53.8	5	5	5	100.6	100.6
Arizona	72.3	115.1	123.3	45.3	84.0	106.9
Arkansas	66.2	131.9	5	36.8	99.3	105.6
California	73.9	101.0	112.3	46.1	69.9	73.3
Colorado	52.1	105.9	110.6	31.1	74.2	77.8
Connecticut	30.5	102.5	121.9	19.8	78.7	93.7
Delaware	37.4	120.4	5	24.1	91.0	5
District of Columbia	11.8	121.4	88.7	18.0	100.1	5
Florida	52.9	135.0	60.2	30.4	101.2	37.7
Georgia	56.6	116.2	73.0	33.3	85.2	45.6
Hawaii	42.0	5	132.9	15.5	76.0	76.7
Idaho	50.3	5	118.6	26.0	5	223.8
Illinois	44.3	144.2	94.8	24.3	105.7	74.3
Indiana	51.9	122.4	64.5	29.1	90.2	5
Iowa	38.5	119.1	79.9	18.8	85.6	5
Kansas	50.8	131.9	86.1	25.8	91.4	48.8
Kentucky	63.5	115.8	56	26.8	86.2	5
Louisiana	52.1	109.1	20.9	28.7	81.7	13.5
Maine	42.7	5	5	23.1	5	82.5
Maryland	36.0	95.5	46.0	18.9	69.1	24.1
Massachusetts	30.9	89.5	121.1	20.3	65.3	95.7
Michigan	43.1	131.1	94.4	22.7	69.5	60.0
Minnesota	30.6	151.7	79.4	15.3	111.6	40.8
Mississippi	55.5	112.7	5	34.0	85.6	5
Missouri	50.3	143.9	46.4	27.9	110.6	28.4
Montana	39.7	5	5	19.3	5	70.5
Nebraska	36.9	135.1	81.7	18.4	101.4	45.6
Nevada	68.9	129.3	107.5	37.8	92.4	66.8
New Hampshire	33.1	5	**	17.1	5	**
New Jersey	28.1	99.6	79.9	15.1	69.6	51.8
New Mexico	75.6	94.6	96.9	5	63.2	119.6
New York	36.7	75.6	81.6	21.3	53.8	55.1
North Carolina	52.0	106.6	106.1	31.8	76.6	72.4
North Dakota	29.2	5	5	12.1	5	52.5

TABLE 5. Birth rates\* for 15- to 19-year-olds, by age group, race/ethnicity,<sup>†</sup> and state — United States, 1990 — Continued

State	Age group (yrs)					
	15-19		15-17		18-19	
	White	Black	Hispanic <sup>‡</sup>	White	Black	Hispanic
Ohio	47.7	129.4	73.9	25.9	32.3	50.2
Oklahoma	60.2	116.0	**	33.4	81.5	**
Oregon	54.0	108.0	113.9	29.6	80.2	77.3
Pennsylvania	36.1	124.8	126.1	20.1	94.1	97.6
Rhode Island	38.7	114.3	129.8	27.0	92.5	94.5
South Carolina	54.3	101.1	66.8	32.4	71.1	5
South Dakota	35.0	5	5	16.5	5	5
Tennessee	60.3	121.3	40.9	33.8	90.3	94.3
Texas	70.6	114.0	103.8	43.4	82.1	67.8
Utah	47.8	5	115.0	25.8	5	81.8
Vermont	34.3	5	5	19.6	5	5
Virginia	41.1	98.5	55.5	21.6	71.3	33.2
Washington	52.2	94.3	113.4	28.2	63.4	71.5
West Virginia	55.1	74.4	5	32.7	47.3	5
Wisconsin	31.2	114.7	90.4	16.1	123.2	54.8
Wyoming	54.5	5	94.2	28.2	5	95.6

\* Live births per 1,000 women.

<sup>†</sup> Women of Hispanic origin may be of any race.<sup>‡</sup> Rates not calculated for states with  $\leq 20$  births to women in a given age and racial/ethnic group or if there were  $\leq 1,000$  women in the age and racial/ethnic group.

\* Rates for all races other than white.

\* Hispanic origin not reported on birth certificate.

TABLE 6. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates,<sup>§</sup> for 15- to 19-year-olds, by state — United States, 1990 compared with 1980

State	Pregnancy rates				Abortion rates				Birth rates	
	1980	1990	Percent change NBS1	1980	1990	Percent change NBS2	1980	1990	Percent change NBS3	
Alabama	97.8	**	NA	29.6	**	NA	68.3	71.0	4	
Alaska	98.5	**	NA	34.0	**	NA	64.4	65.3	1	
Arizona	89.0	101.8	14	23.5	26.3	-12	65.5	75.5	15	
Arkansas	94.1	98.4	5	19.5	18.3	-6	74.5	80.1	7	
California	109.6	**	NA	56.3	**	NA	53.3	70.6	32	
Colorado	89.4	82.3	-8	39.5	27.7	-30	49.9	54.5	9	
Connecticut	60.3	**	NA	29.8	**	NA	30.5	38.8	27	
Delaware	87.4	**	NA	36.2	**	NA	51.2	54.5	6	
District of Columbia	268.5	255.2	-4	204.0	162.1	-21	62.4	93.1	49	
Florida	106.0	**	NA	47.5	**	NA	58.5	69.1	18	
Georgia	108.7	110.8	2	36.8	35.3	-4	71.9	75.5	5	
Hawaii	83.9	88.2	5	33.2	27.0	-19	50.7	61.2	21	
Idaho	76.6	58.8	-23	17.2	8.2	-52	59.5	50.6	-15	
Illinois	84.5	**	NA	28.7	**	NA	56.8	62.9	13	
Indiana	77.0	74.3	-3	19.5	15.7	-19	57.5	58.6	12	
Iowa	59.1	**	NA	16.2	**	NA	43.0	40.5	-6	
Kansas	95.5	81.1	-15	38.7	25.0	-35	56.8	56.1	-1	
Kentucky	85.9	91.6	6	13.5	23.4	-73	72.3	67.6	-7	
Louisiana	96.7	92.1	-5	20.7	17.8	-14	76.0	74.2	-2	
Maine	70.6	68.4	-3	23.1	25.4	-10	47.4	43.0	-9	
Maryland	88.8	84.7	-5	45.4	31.4	-31	43.4	53.2	23	
Massachusetts	74.8	71.1	-5	46.7	36.0	-23	28.1	35.1	25	
Michigan	76.1	85.2	12	31.1	26.1	-16	46.0	59.0	31	
Minnesota	68.5	62.5	-9	33.1	25.7	-22	35.4	36.3	2	
Mississippi	97.1	97.8	-1	13.4	16.8	-25	83.7	81.0	-3	
Missouri	83.1	82.6	-1	25.3	19.7	-22	57.8	62.8	9	
Montana	78.0	81.7	-5	29.6	33.3	-13	48.5	48.4	0	
Nebraska	73.4	74.2	-1	28.3	31.9	-13	45.1	42.3	-6	
Nevada	118.1	107.5	-9	59.5	34.2	-43	58.5	73.3	25	
New Hampshire	56.4	**	NA	22.8	**	NA	33.6	33.0	-2	
New Jersey	58.8	75.3	28	23.6	34.8	47	35.2	40.5	15	
New Mexico	95.9	100.4	5	24.1	22.3	-8	71.8	78.2	9	
New York	80.0	92.9	16	45.1	49.3	9	34.8	43.6	25	
North Carolina	95.0	106.4	12	37.5	38.8	-3	57.5	67.6	18	
North Dakota	73.7	56.4	-23	32.1	21.0	-34	41.7	-15		

TABLE 6. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>§</sup> and birth rates<sup>¶</sup> for 15- to 19-year-olds, by state — United States, 1990 compared with 1980 — Continued

State	Pregnancy rates			Abortion rates			Birth rates		
	1980	1990	Percent change NB1	1980	1990	Percent change NB2	1980	1990	Percent change NB3
Ohio	74.7	74.5	0	22.2	16.6	-25	52.5	57.9	10
Oklahoma	100.9	**	NA	26.3	**	NA	74.6	66.8	-10
Oregon	96.2	89.2	-7	45.2	34.6	-24	50.9	54.6	-7
Pennsylvania	77.1	74.6	-3	36.6	29.7	-19	40.5	44.9	11
Rhode Island	74.9	87.7	17	42.0	43.8	4	33.0	43.9	33
South Carolina	91.3	95.0	4	26.5	23.6	-11	64.8	71.3	10
South Dakota	67.0	56.9	-15	14.4	10.6	-30	52.6	46.8	-11
Tennessee	97.8	101.8	4	33.7	29.5	-13	64.1	72.3	13
Texas	111.8	102.8	-8	37.5	27.4	-27	74.3	75.3	1
Utah	79.9	63.0	-21	14.7	14.5	-1	65.2	48.5	-26
Vermont	77.3	72.1	-7	37.8	38.0	1	39.5	34.0	-14
Virginia	88.8	86.5	-3	40.5	33.6	-17	48.3	52.9	9
Washington	98.9	95.4	-4	52.5	42.2	-19	46.7	53.1	14
West Virginia	78.2	67.4	-14	10.4	10.0	-4	67.8	57.3	-15
Wisconsin	65.1	66.6	2	25.5	24.0	-6	39.5	42.6	8
Wyoming	89.2	62.2	-30	10.4	5.9	-43	78.7	56.3	-29

\* Percent change is rounded to whole numbers.

† The sum of live births and legal induced abortions per 1,000 women. 1980 Rates include estimates for states not reporting abortions by age (5).

§ Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age in each state were distributed according to distribution of known age in that state (for states reporting age). 1980 Rates include estimates for states not reporting abortions by age (5).

¶ Live births per 1,000 women.

\*\* Because abortion data were not available, rates could not be calculated.

NA = Not available.

NB1: The percent change in pregnancy rates was not statistically significant in Maine, Mississippi, Missouri, Montana, Nebraska, Ohio, and Wisconsin.

NB2: The percent change in abortion rates was not statistically significant in Arkansas, Rhode Island, Utah, Vermont, and West Virginia. NB3: The percent change in birth rates was not statistically significant in Alaska, Delaware, Indiana, Kansas, Louisiana, Minnesota, Montana, and New Hampshire.

TABLE 7. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>§</sup> and birth rates,<sup>¶</sup> for 15- to 17-year-olds, by state — United States, 1990 compared with 1980

State	Pregnancy rates			Abortion rates			Birth rates		
	1980	1990	Percent change NB1	1980	1990	Percent change NB2	1980	1990	Percent change NB3
Alabama	68.0	**	NA	20.9	**	NA	47.1	47.4	1
Alaska	53.0	**	NA	23.4	**	NA	29.7	31.2	5
Arizona	56.7	63.7	60.4	14	15.2	15.9	40.4	47.7	18
Arkansas	63.3	60.4	-5	16.0	10.9	-33	48.3	50.4	4
California	73.6	**	NA	42.8	**	NA	30.9	44.6	45
Colorado	56.0	53.8	-4	27.5	20.7	-25	28.5	33.1	16
Connecticut	36.5	**	NA	18.1	**	NA	17.4	26.4	52
Delaware	63.6	**	NA	22.4	**	NA	36.1	38.4	6
District of Columbia	273.3	**	NA	33.4	**	NA	49.1	88.4	80
Florida	71.1	**	NA	NA	NA	NA	37.7	44.9	19
Georgia	73.8	74.8	1	24.8	24.7	0	48.9	50.1	2
Hawaii	45.0	53.3	19	22.0	20.8	-5	23.0	32.5	41
Idaho	43.2	31.8	-26	11.8	5.4	-54	34.4	26.3	-16
Illinois	59.1	**	NA	24.5	**	NA	34.7	40.1	16
Indiana	49.6	43.9	-11	14.5	8.7	-40	35.1	36.3	1
Iowa	34.4	**	NA	12.1	**	NA	22.3	20.4	-8
Kansas	60.4	49.8	-17	29.9	19.5	-35	30.4	30.4	0
Kentucky	57.8	58.2	1	29.5	17.4	-83	48.3	40.8	-16
Louisiana	63.4	59.1	-7	13.8	9.6	-31	49.6	49.5	0
Maine	41.1	41.5	1	16.4	18.2	11	24.8	23.3	-6
Maryland	55.4	55.2	0	29.1	21.7	-25	26.4	33.5	27
Massachusetts	46.8	45.2	-3	31.4	21.5	-32	15.5	23.7	54
Michigan	45.9	54.1	18	19.3	18.1	-6	26.5	36.0	36
Minnesota	40.2	36.8	-11	22.8	15.9	-30	17.4	19.9	14
Mississippi	69.7	70.5	1	9.4	13.0	38	60.3	57.5	-5
Missouri	54.5	50.3	-8	18.9	11.1	-41	35.7	39.3	10
Montana	41.1	46.3	11	16.9	22.3	41	25.9	24.0	-7
Nebraska	44.9	44.0	-2	20.3	21.0	4	24.6	23.0	-7
Nevada	76.0	65.3	-14	43.8	22.8	-48	32.2	42.5	32
New Hampshire	32.4	**	NA	14.9	**	NA	17.5	17.1	-2
New Jersey	35.7	46.9	32	14.2	22.5	59	21.5	24.4	14
New Mexico	58.8	62.0	5	14.6	15.1	3	46.9	46.9	6
New York	51.5	61.5	19	30.5	34.0	12	21.1	27.5	31
North Carolina	66.7	73.0	9	28.0	0	NA	38.7	44.9	16
North Dakota	44.4	24.8	-44	NA	NA	NA	22.7	9.2	-29

**TABLE 7. Percent change\* in pregnancy rates,<sup>1</sup> abortion rates,<sup>2</sup> and birth rates<sup>3</sup> for 15- to 17-year-olds, by state — United States, 1990 compared with 1980 — Continued**

State	Pregnancy rates				Abortion rates				Birth rates	
	1980	1990	Percent change NB1	1980	1990	Percent change NB2	1980	1990	Percent change NB3	
Ohio	43.9	43.8	0	13.4	9.5	-29	30.5	34.3	12	
Oklahoma	63.3	**	NA	**	NA	NA	46.1	38.8	-16	
Oregon	61.2	54.6	-11	33.8	23.9	-29	27.4	30.7	12	
Pennsylvania	49.8	48.6	-2	25.7	20.2	-21	24.1	28.4	18	
Rhode Island	40.1	56.2	40	23.1	24.6	-7	17.0	31.6	85	
South Carolina	65.2	62.7	-4	20.2	15.7	-22	45.0	47.0	4	
South Dakota	37.1	31.6	-15	9.8	7.7	-22	27.3	23.9	-12	
Tennessee	66.1	65.5	-1	22.6	20.6	-9	43.5	45.0	3	
Texas	73.6	64.5	-12	25.4	16.5	-35	48.2	48.0	0	
Utah	49.3	34.8	-30	12.6	8.5	-33	36.7	26.3	-28	
Vermont	43.5	47.6	9	22.7	28.0	24	20.8	19.5	-6	
Virginia	59.6	55.0	-8	29.5	22.9	-22	30.0	32.7	7	
Washington	62.4	58.3	-7	37.6	28.7	-24	24.9	29.6	19	
West Virginia	49.7	39.3	-21	7.6	6.2	-18	42.1	33.0	-21	
Wisconsin	38.6	39.9	3	18.2	15.6	-14	20.5	24.2	18	
Wyoming	51.7	32.7	-37	3.0	-59	44.3	29.7			

\*Percent change is rounded to whole numbers.

<sup>1</sup>The sum of live births and legal induced abortions per 1,000 women. 1980 Rates include estimates for states not reporting abortions by age (5).

<sup>2</sup>Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age in each state were distributed according to distribution of known age in that state (for states reporting age). 1980 Rates include estimates for states not reporting abortions by age (5).

<sup>3</sup>Live births per 1,000 women.

\*\*Because abortion data were not available, rates could not be calculated.

NA = Not available.

NB1: The percent change in pregnancy rates was not statistically significant in Arkansas, Colorado, Georgia, Kentucky, Maine, Maryland, Massachusetts, Mississippi, Nebraska, New Mexico, Ohio, Tennessee, Vermont, and Wisconsin.

NB2: The percent change in abortion rates was not statistically significant in Arizona, Georgia, Hawaii, Maine, Nebraska, New Mexico, North Carolina, and Rhode Island.

NB3: The percent change in birth rates was not statistically significant in Alabama, Alaska, Arkansas, Delaware, Georgia, Indiana, Kansas, Louisiana, Maine, Montana, Nebraska, New Hampshire, New Mexico, South Carolina, Tennessee, Texas, and Vermont.

TABLE 8. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates<sup>§</sup> for 18- to 19-year-olds, by state — United States, 1990 compared with 1980

State	Pregnancy rates				Abortion rates				Birth rates			
	1980	1990	Percent change NB1	1980	1990	Percent change NB2	1980	1990	Percent change NB3	1980	1990	Percent change NB4
Alabama	140.2	**	NA	41.9	**	NA	98.4	101.4	3	119.9	120.6	0
Alaska	170.9	**	NA	50.9	**	NA	100.5	111.6	11	120.6	120.7	6
Arizona	135.6	151.4	12	35.1	39.8	13	114.3	104.3	-9	100.6	104.3	3
Arkansas	140.7	150.3	7	26.4	29.6	12	84.5	104.3	23	75.2	84.5	11
California	159.6	**	NA	75.2	**	NA	78.3	82.9	6	53.9	53.9	6
Colorado	133.9	119.8	-10	55.6	37.0	-33	NA	NA	NA	70.8	71.4	1
Connecticut	98.7	**	NA	47.9	**	NA	NA	NA	NA	76.6	96.7	26
Delaware	121.2	**	NA	50.4	**	NA	NA	NA	NA	88.7	100.6	13
District of Columbia	411.0	**	NA	34.4	**	NA	NA	NA	NA	108.5	110.4	1
Florida	156.6	**	NA	67.9	**	NA	NA	NA	NA	105.4	102.0	-3
Georgia	159.7	157.5	-1	54.3	49.1	-10	91.7	91.7	0	84.0	84.8	-13
Hawaii	141.4	137.8	-3	49.7	35.8	-28	NA	NA	NA	86.2	93.3	-8
Idaho	121.2	96.8	-20	24.3	12.1	-50	NA	NA	NA	87.8	87.8	-1
Illinois	143.0	**	NA	56.8	**	NA	NA	NA	NA	88.6	88.6	0
Indiana	115.1	112.4	-2	26.4	24.6	-7	NA	NA	NA	71.0	65.7	-7
Iowa	92.5	**	NA	21.6	**	NA	NA	NA	NA	91.8	89.9	-2
Kansas	142.1	122.1	-14	50.3	32.2	-36	106.9	103.0	-4	106.9	106.9	-6
Kentucky	126.1	134.3	6	19.2	31.3	62	113.1	111.0	-5	113.1	111.0	-5
Louisiana	143.6	135.6	-6	30.5	28.7	-6	NA	NA	NA	68.8	68.8	-15
Maine	114.1	103.5	-9	33.1	34.1	5	81.0	81.0	0	78.4	78.4	0
Maryland	131.3	122.2	-7	62.0	43.8	-29	69.3	78.4	13	71.6	87.5	24
Massachusetts	111.6	98.0	-12	66.8	51.0	-24	44.8	47.0	5	57.6	57.6	-4
Michigan	116.4	125.4	8	44.8	36.6	-18	111.0	111.0	0	81.6	81.6	0
Minnesota	107.6	96.0	-11	47.3	38.4	-19	88.6	93.0	5	86.3	86.3	5
Mississippi	136.2	132.7	-3	19.1	21.7	13	NA	NA	NA	110.3	110.3	0
Missouri	122.8	123.8	1	34.2	30.8	-10	NA	NA	NA	124.2	124.2	0
Montana	131.3	135.8	3	49.7	50.0	1	NA	NA	NA	55.1	55.1	0
Nevada	111.6	114.3	2	46.3	46.3	19	81.6	81.6	0	68.0	68.0	0
Nebraska	181.1	164.8	-9	83.2	49.7	-40	97.9	115.1	18	51.3	51.3	-7
New Hampshire	88.6	**	NA	33.5	**	NA	NA	NA	NA	NA	NA	NA
New Jersey	90.9	113.8	25	33.8	51.4	52	62.4	62.4	0	113.0	113.0	0
New Mexico	151.2	157.1	4	38.2	32.9	-14	NA	NA	NA	55.1	55.1	0
New York	121.7	131.5	8	66.7	66.1	2	NA	NA	NA	63.4	63.4	0
North Dakota	133.6	145.9	9	50.5	51.4	2	83.2	94.4	14	68.2	68.2	-9
North Dakota	112.8	99.5	-12	44.6	37.2	-17	NA	NA	NA	NA	NA	NA

TABLE 8. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates<sup>§</sup> for 18- to 19-year-olds, by state — United States, 1990 compared with 1980 — Continued

State	Pregnancy rates		Abortion rates		Birth rates				
	1980	1990	Percent change NA <sub>1</sub>	1980	1990	Percent change NA <sub>2</sub>	1980	1990	Percent change NA <sub>3</sub>
Ohio	118.3	113.7	-4	34.8	25.6	-26	83.6	88.1	5
Oklahoma	152.4	**	NA	38.8	**	NA	113.6	104.3	-8
Oregon	145.0	137.3	-5	61.2	49.4	-19	83.8	87.9	5
Pennsylvania	115.2	106.1	-8	51.7	41.2	-20	63.5	64.9	2
Rhode Island	118.1	118.0	0	65.4	62.2	-5	52.7	55.7	6
South Carolina	127.6	134.9	6	35.2	33.5	-5	92.4	101.4	10
South Dakota	107.6	92.1	-14	20.5	13.5	-34	87.1	78.7	-10
Tennessee	142.5	148.2	4	49.4	40.9	-17	93.2	107.3	15
Texas	165.2	154.4	-16	54.5	42.2	-23	110.7	112.2	-1
Utah	124.5	101.4	-19	24.4	22.7	-7	100.1	78.7	-21
Vermont	117.8	98.4	-16	56.0	48.8	-13	61.9	49.6	-20
Virginia	130.2	124.0	-5	56.1	46.3	-17	74.2	77.7	5
Washington	150.2	144.8	-4	72.8	60.3	-17	77.3	84.4	9
West Virginia	119.9	105.0	-12	15.3	15.2	-1	106.6	89.9	-14
Wisconsin	106.3	100.8	-5	40.4	34.8	-14	66.9	0	
Wyoming	139.3	108.5	-22	14.5	10.4	-28	124.9	98.1	-21

\*Percent change is rounded to whole numbers.

†The sum of live births and legal induced abortions per 1,000 women. 1980 Rates include estimates for states not reporting abortions by age (5).

‡Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age in each state were distributed according to distribution of known age in that state (for states reporting age). 1980 Rates include estimates for states not reporting abortions by age (5).

<sup>§</sup>Live births per 1,000 women.

\*\*Because abortion data were not available, rates could not be calculated.

NA = Not available.

NB: The percent change in pregnancy rates was not statistically significant in Georgia, Hawaii, Indiana, Mississippi, Missouri, Montana, Nebraska, New Mexico, and Rhode Island.

NB2: The percent change in abortion rates was not statistically significant in Maine, Montana, North Carolina, Rhode Island, South Carolina, Utah, and West Virginia.

NB3: The percent change in birth rates was not statistically significant in Alabama, Alaska, Delaware, Indiana, Kansas, Montana, New Hampshire, North Dakota, Pennsylvania, Rhode Island, Texas, and Wisconsin.

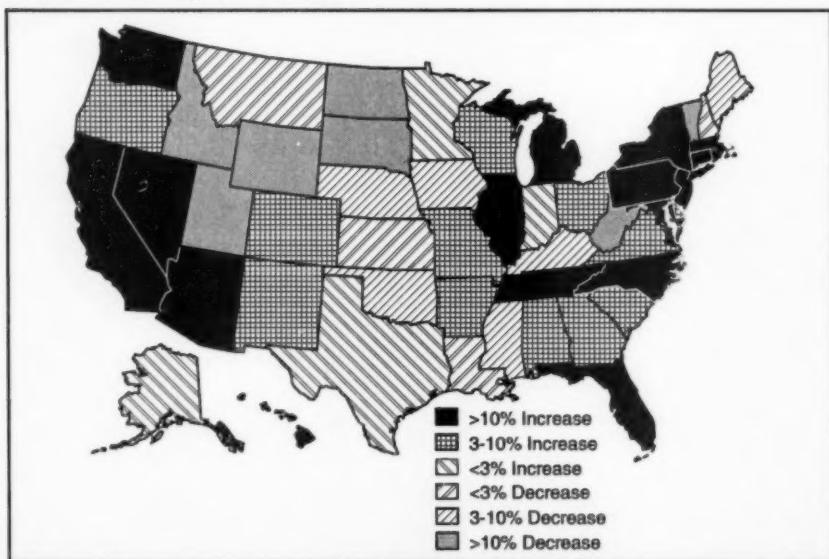
Abortion rates reported for states were more likely to show declines than were pregnancy rates, and those declines were proportionately larger (Table 6). Declines in abortion rates for women ages 15–19 years were observed in 26 of the 40 states and in DC. In 24 of these 27 areas, the declines were >10%; 15 states reported declines of >20%. Abortion rates increased in nine states, with increases of >10% in six of these states.

Abortion rates for teenagers ages 15–17 years showed the same patterns as pregnancy rates. Rates decreased in 26 of the 40 states; in 22 of these states, the declines exceeded 20%. Abortion rates for the older teenagers also declined in 26 of the 40 states; the declines exceeded 20% in 11 of these states.

Unlike pregnancy and abortion rates, birth rates in most states increased in 1990 compared with 1980. Because the declines in abortion rates generally exceeded those in pregnancy rates, birth rates for women ages 15–19 years increased in 29 states and in DC (Table 6 and Figure 2). Rates in 18 of the 30 areas increased by >10%; in 10 areas, rates increased by >20%. Birth rates declined in only 13 states; in seven of these, declines exceeded 10%.

Birth rates by state for younger teenagers (ages 15–17 years) were also more likely to increase (23 states and DC) than to decline (nine states) (Table 7). This increase also was noted for the older teenagers (ages 18–19 years); rates increased in 24 states and DC and declined in 14 states (Table 8). Increases tended to be smaller for the older age group than for the younger.

**FIGURE 2. Percent change in birth rates for women ages 15–19 years — United States,\* 1990 compared with 1980**



\*The percent change was not statistically significant in Alaska, Delaware, Indiana, Kansas, Louisiana, Minnesota, Montana, and New Hampshire.

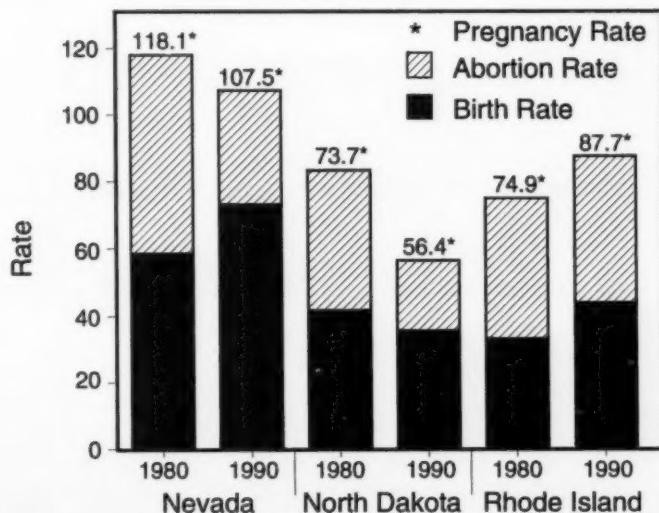
Pregnancy and abortion rates and relative changes over time in these rates affect the birth rates and the percent change in these birth rates in a given area. To illustrate how the varying patterns of change in pregnancy and abortion rates affect changes in the birth rate in a given state, we discuss these rates for 15- to 19-year-olds in three states: Nevada, North Dakota, and Rhode Island (Figure 3).

The pregnancy rate in Nevada declined by 9% in 1990 compared with 1980, but the abortion rate decreased by much more (43%); the net result was a 25% increase in Nevada's birth rate. In North Dakota, changes in pregnancy, abortion, and birth rates were more consistent; the pregnancy rate declined by 23% and the abortion rate decreased by 34%. The birth rate in this state also declined, but to a lesser extent (15%). A different pattern is illustrated by Rhode Island, where the pregnancy rate increased by 17%, but the abortion rate did not change. As a result, the birth rate increased by 33%. These illustrations demonstrate that a change in either the pregnancy or abortion rate can change the overall birth rate in any state.

#### Rates of Pregnancy, Abortion, and Birth by Race/Ethnicity, 1990 Compared with 1980

Pregnancy, abortion, and birth rates for white and black teenagers for 1990 compared with 1980 differ considerably (Tables 9 and 10). Data for 1990 and 1980 for Hispanic women were not examined because only 22 states reported Hispanic origin on the 1980 birth certificates and because abortions were not classified by Hispanic origin in 1980. Generally, pregnancy and abortion rates for white teenagers ages 15-19 years were more likely to decline than to increase; the opposite was true for

**FIGURE 3. Pregnancy, abortion, and birth rates for women ages 15-19 years — selected states, 1980 and 1990**



\*Per 1,000 women ages 15-19 years.

TABLE 9. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates<sup>§</sup> for white 15- to 19-year-olds, by state — United States, 1990 compared with 1980

State	Pregnancy rates**				Abortion rates**				Birth rates			
	1980		1990		1980		1990		1980		1990	
	Percent change NA1	NA	Percent change NA1	NA	Percent change NA2	NA	Percent change NA2	NA	Percent change NA3	NA	Percent change NA3	NA
Alabama	††	††	NA	NA	††	††	††	NA	52.6	55.3	5	5
Alaska	††	††	99.9	18	23.8	27.6	16	NA	52.9	53.8	2	2
Arizona	84.6	99.9	-1	20.1	16.6	-17	63.2	60.8	72.3	66.2	19	19
Arkansas	83.3	82.7	NA	NA	51.0	††	NA	52.5	73.9	41	5	41
California	103.5	††	NA	NA	55	55	NA	48.2	52.1	8	8	8
Colorado	55	55	NA	NA	††	††	NA	44.9	30.5	22	22	22
Connecticut	††	††	NA	NA	††	††	NA	37.1	37.4	1	1	1
Delaware	††	††	NA	NA	††	††	NA	16.7	11.8	-30	23	23
District of Columbia	††	††	NA	NA	††	††	NA	43.0	52.9	23	23	23
Florida	††	††	NA	NA	††	††	NA	54.0	56.6	5	5	5
Georgia	92.5	86.2	-7	38.5	29.6	-23	54.0	41.6	42.0	-15	5	5
Hawaii	75.5	55	NA	33.9	55	NA	59.5	59.5	50.3	-10	10	10
Idaho	76.7	58.6	-24	17.1	8.2	-52	44.3	41.9	44.3	6	6	6
Illinois	67.7	††	NA	25.7	††	NA	52.5	51.9	51.9	-1	-1	-1
Indiana	70.4	65.5	-7	17.9	13.6	-24	41.6	38.5	38.5	-7	-7	-7
Iowa	††	††	NA	††	††	NA	52.1	50.8	50.8	-3	-3	-3
Kansas	90.0	74.5	-17	37.9	23.7	-38	69.4	63.5	63.5	-8	-8	-8
Kentucky	††	84.3	NA	††	20.8	NA	58.1	52.1	52.1	-10	-10	-10
Louisiana	55	68.7	NA	55	16.7	NA	47.1	42.7	42.7	-9	-9	-9
Maine	70.4	67.6	-4	23.2	24.9	7	42.6	31.9	36.0	13	13	13
Maryland	74.5	61.5	-18	42.6	25.4	-40	26.0	30.9	30.9	19	19	19
Massachusetts	††	††	NA	††	††	NA	37.6	43.1	43.1	14	14	14
Michigan	††	††	NA	††	††	NA	33.1	30.6	30.6	-8	-8	-8
Minnesota	65.4	55.3	-15	32.3	24.7	-23	56.3	55.5	55.5	-1	-1	-1
Mississippi	72.3	71.6	-1	16.0	16.1	1	NA	NA	NA	NA	NA	NA
Missouri	72.2	64.8	-10	22.3	14.5	-35	49.9	50.3	50.3	1	1	1
Montana	73.5	55	NA	30.2	55	NA	43.4	39.7	39.7	-9	-9	-9
Nebraska	††	††	NA	††	††	NA	41.7	36.9	36.9	-11	-11	-11
Nevada	113.3	105.8	-7	61.1	36.9	-40	52.2	68.9	68.9	32	32	32
New Hampshire	††	††	NA	††	††	NA	33.6	33.1	33.1	-1	-1	-1
New Jersey	42.6	52.7	24	18.7	24.6	32	23.9	28.1	28.1	18	18	18
New Mexico	9.9	99.6	8	24.9	24.0	-4	67.0	75.6	75.6	37	37	37
New York	62.7	76.3	22	36.0	39.7	10	26.7	34.3	34.3	15	15	15
North Carolina	80.5	86.3	-27	35.3	35.3	NA	45.3	52.0	52.0	-21	-21	-21
North Dakota	70.1	NA	-28	33.1	33.1	NA	36.9	36.9	36.9	-21	-21	-21

TABLE 9. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates<sup>§</sup> for white 15- to 19-year-olds, by state — United States, 1990 compared with 1980 — Continued

State	Whites						Birth rates Percent change NB <sub>3</sub>	
	Pregnancy rates**		Abortion rates**		Birth rates			
	1980	1990	Percent change NB <sub>1</sub>	1980	1990	Percent change NB <sub>2</sub>		
Ohio	66.0	60.5	-8	19.4	12.9	-34	46.6 47.7 2	
Oklahoma	94.2	11	NA	26.5	11	NA	67.6 60.2 -11	
Oregon	95.4	88.7	-7	45.6	34.7	124	49.9 54.0 8	
Pennsylvania	11	11	NA	11	11	NA	35.0 35.1 0	
Rhode Island	11	80.4	NA	11	41.7	NA	29.9 38.7 29	
South Carolina	77.9	76.6	-2	28.9	22.3	-23	49.0 54.3 11	
South Dakota	57.9	46.0	-21	13.8	11.0	-20	44.1 36.0 -21	
Tennessee	88.9	86.3	-3	33.7	26.0	-23	56.2 60.3 9	
Texas	11	96.1	NA	11	25.5	NA	68.7 70.6 3	
Utah	79.2	62.2	-22	13.5	14.4	6	65.7 47.8 -27	
Vermont	77.6	72.7	-6	37.9	38.4	1	39.7 34.3 -14	
Virginia	78.7	70.4	-11	40.2	29.3	-27	38.6 41.1 7	
Washington	11	55	NA	11	55	NA	52.2 52.3 15	
West Virginia	11	66.4	NA	11	9.4	NA	67.7 57.1 -16	
Wisconsin	11	11	NA	11	11	NA	34.8 31.2 -10	
Wyoming	11	NA	11	11	11	NA	77.9 54.5 -30	

\* Percent change is rounded to whole numbers.

<sup>†</sup>The sum of live births and legal induced abortions per 1,000 women.

<sup>‡</sup>Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age or race/ethnicity in each state were distributed according to distribution of known age or race/ethnicity in that state (for states reporting age or race/ethnicity).

<sup>§</sup>Live births per 1,000 women.

<sup>\*\*</sup>For calculation of 1990 pregnancy and abortion rates, abortions for white race included women of known Hispanic origin. For 1980, there was no separate designation for women of Hispanic ethnicity.

<sup>††</sup>Because abortion data were not available, rates could not be calculated.

NA = Not available

NB<sub>1</sub>: The percent change in pregnancy rates was not statistically significant in Arkansas, Maine, Mississippi, South Carolina, and Vermont. NB<sub>2</sub>: The percent change in abortion rates was not statistically significant in Maine, Mississippi, New Mexico, North Carolina, Utah, and Vermont.

NB<sub>3</sub>: The percent change in birth rates was not statistically significant in Alaska, Delaware, Hawaii, Indiana, Kansas, Mississippi, Missouri, New Hampshire, and Pennsylvania.

TABLE 10. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates,<sup>§</sup> for black 15- to 19-year-olds, by state — United States, 1990 compared with 1980

State	Black						Percent change <sup>NA3</sup>	
	Pregnancy rates			Abortion rates				
	1980	1990	Percent change <sup>NA1</sup>	1980	1990	Percent change <sup>NA2</sup>		
Alabama	**	**	NA	**	**	NA	102.9 ††	
Alaska	**	153.5	20	25.8	38.4	49	102.2 115.1 NA	
Arkansas	135.8	157.2	16	127.9	25.2	41	117.9 131.9 13	
California	204.2	**	NA	122.3	**	NA	82.0 101.0 23	
Colorado	55	55	NA	55	55	NA	84.2 105.9 26	
Connecticut	**	**	NA	**	**	NA	85.1 102.5 20	
Delaware	**	**	NA	**	**	NA	109.7 120.4 65	
District of Columbia	**	**	NA	**	**	NA	73.5 124.3 9	
Florida	142.9	162.5	14	33.5	46.3	38	109.4 116.2 6	
Georgia	**	**	NA	**	**	NA	** ** NA	
Hawaii	**	**	NA	**	**	NA	** ** NA	
Idaho	**	**	NA	**	**	NA	** ** NA	
Illinois	160.5	**	NA	40.2	**	NA	120.3 144.2 20	
Indiana	144.7	158.0	9	35.5	35.6	0	109.3 122.4 12	
Iowa	**	**	NA	**	**	NA	** ** NA	
Kansas	175.2	181.1	3	49.2	-13	NA	117.8 119.0 11	
Kentucky	**	164.1	NA	**	48.3	-NA	119.9 115.8 9	
Louisiana	55	128.8***	NA	55	19.6***	NA	106.1 108.3*** NA	
Maine	**	**	NA	**	**	NA	** ** NA	
Maryland	129.1	141.8	10	54.3	46.3	-15	74.8 69.5 28	
Massachusetts	**	**	NA	**	**	NA	** ** NA	
Michigan	**	**	NA	**	**	NA	** ** NA	
Minnesota	199.6	219.4	10	89.1	67.7	-24	90.8 131.1 44	
Mississippi	130.3	130.5	0	10.1	17.8	76	110.5 112.7 37	
Missouri	159.3	197.5	24	46.0	53.6	16	113.4 143.9 27	
Montana	**	**	NA	**	**	NA	** ** NA	
Nebraska	**	**	NA	**	**	NA	** ** NA	
Nevada	178.7	156.8	-12	56.6	27.5	-51	112.3 122.1 20	
New Hampshire	**	**	NA	**	**	NA	** ** NA	
New Jersey	135.3	181.6	34	40.9	82.0	101	94.4 94.8 5	
New Mexico	131.4	115.5	-12	36.6	20.9	-43	94.6 73.2 4	
New York	161.1	166.4	3	88.6	90.8	2	87.2 106.6 22	
North Carolina	131.3	157.3	20	44.1	50.7	15	NA ** NA	
North Dakota	**	**	NA	**	**	NA	** ** NA	

TABLE 10. Percent change\* in pregnancy rates,<sup>†</sup> abortion rates,<sup>‡</sup> and birth rates<sup>§</sup> for black 15- to 19-year-olds, by state — United States, 1990 compared with 1980 — Continued

State	Pregnancy rates			Abortion rates			Birth rates		
	1980	1990	Percent change NS <sup>  </sup>	1980	1990	Percent change NS <sup>  </sup>	1980	1990	Percent change NS <sup>  </sup>
Ohio	139.6	170.1	22	41.8	40.6	-3	97.8	129.4	32
Oklahoma	162.9	**		29.5	**	NA	123.4	116.0	-6
Oregon	165.1	178.0	8	64.5	70.0	9	100.6	108.0	7
Pennsylvania	**	**		NA	**	NA	86.8	124.8	44
Rhode Island	**	198.9		**	84.6	NA	92.8	114.3	23
South Carolina	114.2	127.0	11	22.5	25.9	15	91.7	101.1	10
South Dakota	**	**		NA	**	NA	**	**	NA
Tennessee	134.1	165.6	24	34.0	44.4	30	100.0	121.3	21
Texas	**	153.6	NA	**	39.6	NA	110.4	114.0	3
Utah	**	**		**	**	NA	**	**	NA
Vermont	**	**		NA	**	NA	**	**	NA
Virginia	125.1	149.1	19	43.7	50.6	16	81.4	98.5	21
Washington	**	**		NA	**	NA	81.7	94.3	15
West Virginia	**	103.9	NA	**	29.5	NA	74.9	74.4	1
Wisconsin	**	**	NA	**	**	NA	126.2	174.7	39
Wyoming	**	**	NA	**	**	NA	**	**	NA

\*Percent change is rounded to whole numbers.

<sup>†</sup>The sum of live births and legal induced abortions per 1,000 women.  
<sup>‡</sup>Legal induced abortions per 1,000 women. Abortions obtained by women of unknown age or race/ethnicity in each state were distributed according to distribution of known age or race/ethnicity in that state (for states reporting age or race/ethnicity).

<sup>§</sup>Live births per 1,000 women.

<sup>||</sup>Because abortion data were not available, rates could not be calculated.

<sup>\*\*</sup>Rates not calculated for states with ≤20 births to black women ages 15-19 years or if there were ≤1,000 black women ages 15-19 years.

<sup>¶</sup>Rates not calculated because ≥15% of abortions were obtained by women of unknown age or race/ethnicity.

<sup>||</sup>Rates not calculated for states with ≤20 abortions obtained by black women ages 15-19 years or if there were ≤1,000 black women ages 15-19 years.

<sup>\*\*</sup>Rates for all races other than white.

NA = Not available.

NB1: The percent change in pregnancy rates was not statistically significant in Kansas, Minnesota, Mississippi, New Mexico, and Oregon.

NB2: The percent change in abortion rates was not statistically significant in Indiana, Kansas, New York, Ohio, and Oregon.

NB3: The percent change in birth rates was not statistically significant in Alabama, Arizona, Delaware, Iowa, Louisiana, Nevada, New Mexico, Oklahoma, Oregon, and West Virginia.

black women. Birth rates for both white and black women were more likely to increase than decline, but for white women the increases occurred in relatively fewer states.

Pregnancy rates for white teenagers ages 15–19 years decreased in 15 of 25 states; in eight states, declines were >10% (Table 9). Abortion rates for white teenagers decreased in 16 of the 25 states; the rates decreased by >10% in all of these 16 states; rates for 14 states declined by >20%. Birth rates for white teenagers increased in 25 states (by >10% in 15 states) and decreased in 16 states and DC.

Among black teenagers ages 15–19 years, pregnancy rates increased in 13 of 19 states and declined in one state (Table 10); the increase was >10% in 10 states. Abortion rates for black teenagers were also more likely to increase (10 states) than to decline (four states). Birth rates for black teenagers increased (for the most part, substantially) for DC and for 28 of the 39 states for which rates were computed for both 1980 and 1990. Birth rates rose by >10% in 22 of the states and in DC; 14 states and DC reported increases of >20%.

## DISCUSSION

### Trends in Pregnancy, Abortion, and Birth

Pregnancy and birth rates among teenagers in the United States exceed those in most developed countries (8; Alan Guttmacher Institute, unpublished data, 1988). Small declines in pregnancy and birth rates among teenagers during the early 1980s subsequently reversed, resulting in relatively little net change in the U.S. pregnancy rate in this age group over the decade (1,2).<sup>\*</sup> Recent data indicate that the teenage birth rate increased almost 20% from 1986 through 1990, whereas the abortion-to-live-birth ratio among teenagers decreased by about 21% during the same period. These trends suggest that a larger proportion of pregnancies among teenagers ended in live births (1,9).

Although pregnancy rates among U.S. teenagers did not decline during the 1980s and may have increased in recent years, the actual number of pregnancies among teenagers declined by about 14% from 1980 through 1988, as the number of teenage women declined (2). Women who were teenagers in the late 1980s were born during the early 1970s, after the baby boom and during a period when birth rates dropped to historic low levels.

### Age

This report demonstrates wide state-to-state variation in pregnancy, abortion, and birth rates among teenagers in 1990 as well as in 1980. The variation in these rates for 15- to 19-year-olds reflects the proportionately wider range of such rates among younger teenagers (ages 15–17 years) compared with older teenagers (ages 18–19 years). This diversity, evident among all women and subgroups, may partly reflect higher levels of unintended pregnancy among women ages 15–17 than among women ages 18–19.

\*The National Center for Health Statistics used abortion estimates reported by the Alan Guttmacher Institute (AGI) to calculate national teenage pregnancy rates through 1988 (2). For that report, because age-specific data were not available from AGI, abortion estimates by age were derived from abortion data compiled by CDC's National Center for Chronic Disease Prevention and Health Promotion on the characteristics of women obtaining abortions.

National health objectives for the year 2000 include reducing the pregnancy rate for teenagers ages  $\leq 17$  years to  $\leq 50$  per 1,000 women (4). Nearly half the states that have these data available have reached this goal. In some states, teenagers ages 15–19 have pregnancy or birth rates as low as those in several developed countries (8; Alan Guttmacher Institute, unpublished data, 1988). Such states may have developed and used prevention strategies directed at the needs of both younger and older teenagers; these programs may serve as models for other states.

### Race/Ethnicity

Factors that affect pregnancy and birth rates for all women and for women by racial/ethnic groups include trends in sexual experience among teenagers, socioeconomic status, access to family planning and abortion services, and the use of contraception. For example, a recent study indicated that, although sexual activity among white teenagers increased considerably during the 1980s, the use of condoms at first intercourse rose sharply as well; sexually experienced white teenagers were thus less likely to become pregnant in 1988 than in 1980 (2). However, during 1983–1988, Hispanic and black women were less likely than white women to use contraception during their first reported premarital sexual intercourse (32% and 58%, compared with 70%) (10). Trends in these factors bear further analysis.

An important factor in the rapid increase in birth rates for white teenagers during the 1980s is the growing proportion of these women who are Hispanic (11). Hispanic women have much higher birth rates at all ages than do non-Hispanic white women, but particularly at ages  $< 20$  years (1). For example, the birth rate among teenagers for 1990 was 100 per 1,000 for Hispanics, compared with 43 per 1,000 for non-Hispanic whites. Moreover, the Hispanic teenage population increased 12% from 1986 through 1990, while the non-Hispanic white teenage population declined 10%. Thus, the sustained increase in the birth rate among white teenagers since the mid-1980s partly reflects the combined impact of the higher fertility of Hispanic white teenagers and the growing proportion of the white teenage population that is Hispanic.

### Data Limitations

We could not calculate pregnancy rates among teenagers for 1990 in 10 states because those states did not collect data on the age of women obtaining abortions. These 10 states accounted for approximately 39% of all U.S. abortions in 1990. Because so many pregnancies among teenagers—more than a third—end in abortion and because the rates vary widely by state, complete abortion reporting from each state by age and race/ethnicity is essential for monitoring national and state-specific pregnancy trends among teenagers.

### Consequences

The personal and social impact of pregnancy among teenagers in the United States is enormous; an estimated 95% of such pregnancies are unintended (i.e., they occur sooner than desired or are not wanted at any time) (2,12). From 1985 through 1990, the public costs (e.g., through Aid to Families with Dependent Children, Medicaid, and food stamps) related to teenage childbearing totaled \$120.3 billion (13). Of this amount, an estimated \$48.1 billion could have been saved if each birth had been postponed until the mother was at least 20 years old. Although the cost-benefits of family planning services have not been estimated specifically for teenagers, it is estimated

that for every public dollar spent on family planning services for all women, an average of \$4.40 is saved by averting expenditures for medical services, welfare, and nutritional services (14). These expenses are likely even greater for teenagers, who are at increased risk for pregnancy complications and whose financial resources are usually more limited than those of older women.

### Public Health Implications

More than 70 national health and social welfare organizations support age-appropriate, comprehensive school health education programs to reduce pregnancy among teenagers (15). These programs counsel abstinence as well as provide teenagers with the knowledge and skills they need to avoid unplanned pregnancy. In addition to health education efforts, family planning services for sexually active teenagers are important for reducing pregnancy among teenagers (4).

### References

1. National Center for Health Statistics. Advance report of final natality statistics, 1990. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1993. (Monthly vital statistics report; vol 41, no. 9, suppl).
2. Ventura SJ, Taffel SM, Mosher WD, Henshaw S. Trends in pregnancies and pregnancy rates, United States, 1980-88. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1992. (Monthly vital statistics report; vol 41, no. 6, suppl).
3. Hayes CD. Risking the future: adolescent sexuality, pregnancy, and childbearing. Vol I. Washington, DC: National Academy Press, 1987.
4. National Center for Health Statistics. Health, United States, 1992. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1993.
5. CDC. Teenage pregnancy and birth rates—United States, 1990. MMWR 1993;42:733-7.
6. CDC. Teenage pregnancy and fertility in the United States: 1970, 1974, and 1980: regional and state variations and unintended fertility. Atlanta: US Department of Health and Human Services, Public Health Service, CDC, 1987.
7. Spitz AMS, Strauss LT, Maciak BJ, Morris L. Teenage pregnancy and fertility in the United States, 1970, 1974, and 1980. MMWR 1987;36(No. 1SS):1-10.
8. US Congress, Office of Technology Assessment. International health statistics: what the numbers mean for the United States—background paper. Washington, DC: US Government Printing Office, November 1993. (No. OTA-BP-H-116).
9. Koonin LM, Smith JC, Ramick M. Abortion surveillance—United States, 1990. MMWR 1993;42(No. SS-6):29-57.
10. Mosher WD, McNally JW. Contraceptive use at first premarital intercourse: United States, 1965-1988. Fam Plann Perspect 1991;23:108-16.
11. Bureau of the Census. United States population estimates, by age, sex, race, and Hispanic origin: 1980 to 1991. Washington, DC: US Department of Commerce, Bureau of the Census, 1993. (Current population reports; series P-25, no. 1095).
12. Piccinino L. Unintended pregnancy. In: Wilcox LS, Marks JS, eds. From data to action. Atlanta: US Department of Health and Human Services, Public Health Service, CDC (in press).
13. The Center for Population Options. Teenage pregnancy and too-early childbearing: public costs, personal consequences. 6th ed. Washington, DC: The Center for Population Options, 1992.
14. Forrest JD, Singh S. Public-sector savings resulting from expenditures for contraceptive services. Fam Plann Perspect 1990;22:6-15.
15. The National Coalition to Support Sexuality Education. Fact sheet #2 on comprehensive sexuality education. The SIECUS Report 1992;20:22-3.

## APPENDIX

Information presented in this report is based on abortion and birth data compiled by state health departments and reported to CDC. Pregnancies are computed as the sum of abortions and live births in a specified group. Pregnancy rates could not be calculated for all states because of missing abortion data.

**TABLE 1A. Number of states with available pregnancy, abortion, and birth data — 1990**

Age and race/ethnicity group	Pregnancy	Abortion	Birth
<b>15–19 yrs</b>			
All races	40+DC*	40+DC*	50+DC
White	34†	34†	50+DC
Black	34†	34†	50+DC
Hispanic	28§	28§	48+DC¶
<b>15–17, 18–19 yrs</b>			
All races	40**	40**	50+DC
White	34†	34†	50+DC
Black	34†	34†	50+DC
Hispanic	28§	28§	48+DC¶

\*Except for Alabama, Alaska, California, Connecticut, Delaware, Florida, Illinois, Iowa, New Hampshire, and Oklahoma.

†Except for states in \* and the District of Columbia, Massachusetts, Michigan, Nebraska, Pennsylvania, Wisconsin, and Wyoming.

§Except for areas in \* and † and Kentucky, Louisiana, Maine, Maryland, North Carolina, and South Dakota.

¶Except for New Hampshire and Oklahoma.

\*\*Except for states in \* and the District of Columbia.

DC=District of Columbia.

An additional statistical limitation on the data shown in Tables 1–10 in the text is based on the available numbers of events and the numbers of women in a specified group. That is, rates were not computed if there were ≤20 abortions or births, if there were ≤1,000 women in the specified group, or if ≥15% of abortions were obtained by women of unknown race/ethnicity. These statistical limitations are indicated in the tables.



## Abortion Surveillance — United States, 1990

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### **Abstract**

**Condition:** Since 1980, the number of legal induced abortions reported to CDC has remained fairly stable, varying each year by ≤5%.

**Reporting Period Covered:** This report summarizes and reviews data received by CDC for legal induced abortions obtained in 1990.

**Description of System:** For each year, CDC compiles abortion data received from 52 reporting areas: 50 states, New York City, and the District of Columbia.

**Results:** In 1990, 1,429,577 abortions were reported—a 2.4% increase from 1989. The abortion ratio for 1990 was 345 legal induced abortions per 1,000 live births, and the abortion rate was 24 per 1,000 women ages 15–44 years. Most women undergoing abortions were young, white, and unmarried; most had had no previous live births and were having the procedure for the first time. Approximately half of all abortions were performed before the 8th week of gestation, and 87% were before the 13th week of gestation. Younger women were more likely to obtain abortions later in pregnancy than were older women.

**Interpretation:** Since 1980, the national number (and rate) of abortions has remained relatively stable, with only small (≤5%) year-to-year fluctuations. However, since 1984, the national abortion ratio has declined; in 1990, the abortion ratio was the lowest recorded since 1977. Increasing rates of childbearing may account for some of this decline.

**Actions Taken:** The number and characteristics of women having abortions are needed from all states to furnish an accurate characterization of legal induced abortion in the United States and to assist efforts to identify and reduce preventable causes of morbidity and mortality associated with abortions.

## **INTRODUCTION**

In 1969, CDC began abortion surveillance to document the number and characteristics of women obtaining legal induced abortions and to assist efforts to identify and reduce preventable causes of morbidity and mortality associated with abortions. This report, as in previous years, is based on abortion data provided to the Division of Reproductive Health (DRH), National Center for Chronic Disease Prevention and Health Promotion, CDC.

## **METHODS**

For 1990, DRH compiled data received from 52 reporting areas: 50 states, New York City, and the District of Columbia. The total number of legal induced abortions was

available from all reporting areas, most of which provided information about the characteristics of women obtaining abortions. For 46 reporting areas, data were provided from the central health agency\*; for the remaining six reporting areas, data were provided from hospitals and other medical facilities. Data were reported by the state in which the abortion occurred.

Ages of women obtaining legal induced abortions were grouped by 5-year intervals. For the first time in this report, both ratios (the number of abortions per 1,000 live births) and rates (the number of abortions per 1,000 women) are presented by age group. Ratios were calculated by using the number of live births provided by each state's central health agency (except where noted), and rates were calculated by using the number of women recorded in unpublished tabulations provided by the U.S. Bureau of the Census. Rates for women <15 years of age were based on those for women ages 10–14 years, and rates for women ≥40 years of age were based on those for women ages 40–44 years.

Race was categorized either into three groups (white [which includes Hispanics], black, and all other races) or into two groups (white [which includes Hispanics] and black and other races). For the first time in this yearly report, data on ethnicity are included—both the number and the abortion ratio for women of Hispanic origin are presented. Because of data collection methods for 1990 abortions, Hispanic origin was not reported separately by race. Race-specific estimates for the number of abortions and for abortion ratios were determined by assuming that Hispanic women were white, since 97% of Hispanic women who had a live birth in 1990 were white (1). In some states with relatively large Hispanic populations, the abortion ratio for white women may reflect to a considerable degree abortions among Hispanic women. Such data analyzed by race may be helpful for public health officials who are responsible for family planning and health education programs.

Abortion statistics for 1990 and selected previous years were compared (Table 1). The percentage distributions are based on data from all areas reporting a given characteristic. In contrast to other tables in this report, the summary table excludes all unknown values unless otherwise noted. Abortion ratios and rates are presented by year (Table 2). State-specific characteristics of women obtaining abortions in 1990 are presented (Tables 3–12), and overall tabulations of selected characteristics are given (Tables 13–15).

## RESULTS

In 1990, 1,429,577 legal abortions were reported to CDC—a 2.4% increase over the number reported for 1989 (2) (Table 1). The national abortion rate increased from 23 abortions per 1,000 women ages 15–44 years in 1986 to 24 per 1,000 in 1987 and has since remained at that rate (Table 2 and Figure 1). The national abortion ratio rose slightly, from 354 abortions per 1,000 live births in 1986 to 356 per 1,000 in 1987, and has declined since then to 345 per 1,000 in 1990.

In 1990, as in previous years, the most abortions were performed in California, New York City, and Texas; the fewest were performed in Wyoming, South Dakota, Idaho, and Alaska (2,3) (Table 3). For women whose state of residence was known, approximately 92% had the abortion performed in their own state of residence. The

\*Includes state health departments and the health departments of New York City and the District of Columbia.

TABLE 1. Characteristics of women who obtained legal abortions — United States, selected years, 1972-1990

Characteristic	1972	1973	1976	1980	1985	1986	1987	1988	1989	1990
Reported number of legal abortions	588,760	615,831	988,267	1,297,606	1,328,570	1,328,112	1,353,671	1,371,285	1,396,658	1,429,577
Percent distribution*										
Residence										
In-state	56.2	74.8	90.0	92.6	92.4	91.7	91.4	91.0	91.8	
Out-of-state	43.8	25.2	10.0	7.4	7.6	8.3	8.6	9.0	8.2	
Age (yrs)										
≤19	32.6	32.7	32.1	29.2	26.3	25.3	25.8	24.2	22.4	
20-24	32.5	32.0	33.3	36.5	34.7	34.0	33.4	32.8	32.6	33.2
≥25	34.9	35.3	34.6	35.3	39.0	40.7	40.8	41.9	43.2	44.4
Race										
White	77.0	72.5	66.6	69.9	66.6	67.0	66.4	64.4	64.2	64.8
Black and other	23.0	27.5	33.4	30.1	33.4	33.0	33.6	35.6	35.8	35.2
Hispanic origin	—	—	—	—	—	—	—	—	—	—
Non-Hispanic	—	—	—	—	—	—	—	—	—	9.8
Marital status										
Married	29.7	27.4	24.6	23.1	19.3	20.2	20.8	20.3	20.1	21.7
Unmarried	70.3	72.6	75.4	76.9	80.7	79.8	79.2	79.7	79.9	78.3
Number of live births <sup>†</sup>										
0	49.4	48.6	47.7	58.4	56.3	55.1	53.6	52.4	52.2	49.2
1	18.2	18.8	20.7	19.4	21.6	22.1	22.8	23.4	23.6	24.4
2	13.3	14.2	15.4	13.7	14.5	14.9	15.5	16.0	15.9	16.9
3	8.7	8.7	8.3	5.3	5.1	5.3	5.5	5.6	6.1	6.1
≥4	10.4	9.7	7.9	3.2	2.5	2.6	2.6	2.6	2.6	3.4
Type of procedure										
Curettage	88.6	88.4	92.8	95.5	97.5	97.0	98.6	98.8	98.8	98.8
Suction curettage	65.2	74.9	82.6	89.8	94.6	94.5	93.4	95.1	97.1	96.0
Sharp curettage	23.4	13.5	10.2	5.7	2.9	2.5	3.8	3.5	1.7	2.8
Intrauterine instillation	10.4	10.4	6.0	3.1	1.7	1.4	1.3	1.1	0.9	0.8
Others <sup>§</sup>	1.0	1.2	1.2	1.4	0.8	1.6	1.5	0.3	0.3	—
Weeks of gestation										
≤8	34.0	36.1	47.0	51.7	50.3	51.0	50.4	48.7	49.8	51.6
9-10	30.7	29.4	28.1	26.2	26.6	25.8	26.0	26.4	25.8	25.3
11-12	17.5	17.9	14.4	12.2	12.5	12.2	12.4	12.7	12.6	11.7
13-15	8.4	6.9	4.5	5.1	5.9	6.1	6.2	6.6	6.6	6.4
16-20	8.2	8.0	5.1	3.9	4.1	4.2	4.5	4.2	4.0	4.0
≥21	1.2	1.7	0.9	0.9	0.8	0.8	0.8	1.1	1.0	1.0

\* Excludes unknowns. Since the number of states that reported each characteristic varies from year to year, temporal comparisons should be made with caution. Percent distributions are based on data from all areas reporting a given characteristic and exclude unknown values unless otherwise noted.

† For years 1972-1976, data indicate number of living children.

§ Includes hysterotomy and hysterectomy.

— Not available.

percentage of abortions obtained by out-of-state residents ranged from approximately 53% in the District of Columbia to <1% in Hawaii. Eleven reporting areas in 1990 did not have data available for abortions obtained by out-of-state residents.

In 1990, 40 states, the District of Columbia, and New York City reported legal abortions by age. Women 20–24 years of age obtained approximately 33% of all abortions; women <15 years of age obtained about 1% (Table 4). Abortion ratios were highest for the youngest women (844 abortions per 1,000 live births for women <15 years of age and 515 per 1,000 live births for women 15–19 years of age) and the oldest women (501 per 1,000 live births for women ≥40 years of age); the ratio was lowest for women 30–34 years of age (191 per 1,000 live births) (Figure 2). Among teenagers, the abortion ratio was highest for those <15 years of age and lowest for those 19 years of age (Table 5). Abortion rates were highest among women 20–24 years of age (43 abortions per 1,000 women 20–24 years of age) and lowest among women at the age extremes (one abortion per 1,000 women <15 years of age and three abortions per 1,000 women ≥40 years of age) (Table 4).

For most age groups, the abortion ratio rose from 1974 through the early 1980s and declined thereafter, particularly for the youngest and oldest women (i.e., women <15 years of age and ≥40 years of age) (Figure 3). The abortion ratios for women <15 years of age and 15–19 years of age were higher than those for the other age groups. However, 1990 marked the third year in a row for a downward trend among the youngest women. In 1990, the ratio for women <15 years of age was the lowest recorded for the

**TABLE 2. Number, ratio, and rate of legal abortions and source of reporting — United States, 1970–1990**

Year	Total number of legal abortions	Ratio*	Rate†	Number of areas reporting	
				Central health agency‡	Hospital/ facilities§
1970	193,491	52	5	18	7
1971	485,816	137	11	19	7
1972	586,780	180	13	21	8
1973	615,831	196	14	26	26
1974	763,476	242	17	37	15
1975	854,853	272	18	39	13
1976	988,267	312	21	41	11
1977	1,079,430	325	22	46	6
1978	1,157,776	347	23	48	4
1979	1,251,921	358	24	47	5
1980	1,297,606	359	25	47	5
1981	1,300,760	358	24	46	6
1982	1,303,980	354	24	46	6
1983	1,268,987	349	23	46	6
1984	1,333,521	364	24	44	8
1985	1,328,570	354	24	44	8
1986	1,328,112	354	23	43	9
1987	1,353,671	356	24	45	7
1988	1,371,285	352	24	45	7
1989	1,396,658	346	24	45	7
1990	1,429,577	345**	24	46	6

\*Number of abortions per 1,000 live births.

†Number of abortions per 1,000 women 15–44 years of age.

‡Abortion data reported from central health agency.

§Abortion data reported from hospitals and/or other medical facilities in state.

\*\*Differs from the preliminary ratio (344) published in MMWR, vol. 41, no. 50, December 18, 1992.

time period, and the ratio for women 15–19 years of age was the lowest recorded since 1974. The abortion ratio for women 20–34 years of age (the group with the highest fertility rate) has fluctuated little since 1974 (4).

In 1990, approximately 51% of reported legal abortions were performed before 8 weeks of gestation, and about 87% were done before 13 weeks (Table 6). Approximately 4% of the abortions were performed at 16–20 weeks of gestation, and 1% were performed at ≥21 weeks.

Approximately 97% of legal abortions were performed by curettage, and <1% by intrauterine saline or prostaglandin instillation (Table 7). Hysterectomy and hysterotomy were rarely used; <0.02% of abortions were performed by these methods.

In 1990, 30 states, the District of Columbia, and New York City reported legal abortions by race. As noted in previous reports, almost two thirds of women obtaining abortions were white (2,3) (Table 8). The abortion ratio for black women, however, was about twice that for white women (521 vs. 258 per 1,000 live births). The abortion ratio for women of other minority races was approximately 1.3 times higher (335 per 1,000 live births) than that for white women.

In 1990, for the first time, 22 states and New York City reported legal abortions by Hispanic origin (Table 9). The percentage of Hispanic women obtaining abortions in these reporting areas ranged from <1% in several states to almost 40% in New Mexico. The abortion ratio for Hispanic women from these reporting areas was 258 per 1,000 live births. When abortion ratios for Hispanic and non-Hispanic white women from the same reporting areas were compared (data not shown), the ratio for Hispanic women was lower (258 per 1,000 live births vs. 267 per 1,000). This pattern was consistent among four of the five areas reporting the largest numbers of Hispanic women obtaining abortions (data not shown).

In 1990, approximately 76% of women obtaining abortions were unmarried (Table 10). This percentage varied by state, from about 62% in Utah to almost 85% in Wisconsin. The abortion ratio was approximately 10 times higher for unmarried women than for married women: 879 vs. 89 abortions per 1,000 live births.

Approximately 48% of the women obtaining legal abortions had had no previous live births, and about 89% had had two or fewer previous live births (Table 11). The abortion ratio was highest for women who had had no live births and lowest for women who had had one live birth.

Approximately 56% of women obtaining abortions were having the procedure for the first time, and approximately 16% had had at least two previous abortions (Table 12).

When the age distribution of women undergoing legal abortion was analyzed by race, few differences were found between white women and minority women (Table 13). However, the percentage of minority women <15 years of age who obtained an abortion, although small (1.3%), was more than twice that of white women in this age group. When the percentage of women obtaining a legal abortion was analyzed by race and marital status, a slightly higher proportion of unmarried minority women was noted (80.7% of women of black and other races vs. 76.2% of white women).

Overall, most women obtained abortions during the first 12 weeks of pregnancy. However, women <15 years of age were more likely than older women to obtain abortions later in pregnancy (Table 14). The percentage of women obtaining an early abortion ( $\leq 8$  weeks of gestation) increased with age, and the percentage obtaining a

late abortion ( $\geq 16$  weeks of gestation) decreased with age (Figure 4). Women of black and other races tended to obtain abortions later in pregnancy than did white women (Table 14).

More than 99% of abortions at  $\leq 12$  weeks of gestation were performed by curettage (primarily suction procedures) (Table 15). For abortions performed later than 12 weeks of gestation, curettage was also the most common procedure, although it was usually

**TABLE 3. Reported number, ratio, and rate of legal abortions and percentage of abortions obtained by out-of-state residents, by state of occurrence — United States, 1990**

State	Total number of legal abortions*	Ratio†	Rate‡	Percentage of legal abortions obtained by out-of-state residents§
Alabama	15,012**	237	16	—
Alaska	1,489**	125	11	—
Arizona	15,783	229	19	2.5
Arkansas	5,953	163	11	3.2
California	357,579††	585	50	—
Colorado	12,679	237	16	8.2
Connecticut	18,776	375§§	24	—
Delaware	5,557	500	34	—
District of Columbia	19,969	—¶	—***	52.9
Florida	66,071	332	24	—
Georgia	39,245	349	24	8.3
Hawaii	4,748	232	18	0.8
Idaho	1,390	85	6	9.0
Illinois	67,350	345	25	—
Indiana	14,351	167	11	3.6
Iowa	7,166**	182	12	—
Kansas	7,516††	193§§	14	46.5
Kentucky	10,921	202	13	29.3
Louisiana	13,020	181	13	—
Maine	4,607	266	16	12.6
Maryland	22,425	279§§	19	6.8
Massachusetts	39,739	430	27	3.9
Michigan	36,183	236	16	4.2
Minnesota	17,156	252	17	10.7
Mississippi	6,842	157	11	22.7
Missouri	16,366	207	14	10.8
Montana	3,365	290	19	23.6
Nebraska	6,346	260	18	20.2
Nevada	7,226	331	26	11.2
New Hampshire	4,259**	243	16	—
New Jersey	41,358	337	23	3.0
New Mexico	5,288	194	15	3.9
New York	159,098	545	37	3.4
(City)	102,202§§	787	—	2.9
(State)	56,896	351	—	4.2
North Carolina	36,494	349	23	8.3
North Dakota	1,723	186	12	38.2
Ohio	32,165	193	13	9.7
Oklahoma	10,708**	225§§	15	—
Oregon	13,658	319	21	9.6
Pennsylvania	52,143	305	19	5.9
Rhode Island	7,782	512§§	33	21.7
South Carolina	13,285	227	16	6.1
South Dakota	946	86	6	19.4
Tennessee	21,144	282	18	17.4
Texas	92,580	293	23	3.9
Utah	4,786	132	12	15.2
Vermont	3,184	384	23	29.8

**TABLE 3. Reported number, ratio, and rate of legal abortions and percentage of abortions obtained by out-of-state residents, by state of occurrence — United States, 1990 — Continued**

State	Total number of legal abortions*	Ratio†	Rate‡	Percentage of legal abortions obtained by out-of-state residents§
Virginia	32,992	334	21	6.0
Washington	31,443	397	27	4.9
West Virginia	2,500	111	6	11.7
Wisconsin	16,848	232	15	6.1
Wyoming	363	52	4	12.4
<b>Total</b>	<b>1,429,577</b>	<b>345.111</b>	<b>24</b>	<b>8.2</b>

\*Abortion data from central health agency unless otherwise noted.

†Abortions per 1,000 live births (live-birth data from central health agency unless otherwise specified).

‡Abortions per 1,000 women ages 15–44 years (number of women ages 15–44 from U.S. Department of Commerce, Bureau of the Census, *Current Population Survey*, March 1990, tape technical documentation, Washington, DC).

§Based on number of abortions for which residence status of women was known.

\*\*Reported from hospitals and/or other medical facilities in state.

††CDC estimate.

††Live births reported from CDC's National Center for Health Statistics, *Advance Report of Final Natality Statistics*, 1990, vol. 41, no. 9, supplement, February 25, 1993.

¶¶>1,000 Abortions per 1,000 live births.

\*\*\*>1,000 Abortions per 1,000 women ages 15–44 years.

†††Includes 330 Kansas residents obtaining abortions in other states.

†††Reported by New York City Health Department.

†††Differs from the preliminary ratio (344) published in MMWR, vol. 41, no. 50, December 18, 1992.

—Not reported.

reported as dilatation and evacuation (D&E) (not shown). Most intrauterine instillations involved the use of saline and were usually performed at 16 weeks of gestation or later.

## DISCUSSION

From 1970 through 1982, the reported number of legal abortions in the United States increased every year (Figure 1); the largest percentage increase occurred during 1970–1972. From 1976 through 1982, this annual increase steadily declined, reaching a low of 0.2% for 1980–1981. Since 1980, the number of abortions has remained relatively stable, with only small ( $\leq 5\%$ ) year-to-year fluctuations.

The abortion ratio increased steadily from 1970 through 1980, decreased slightly from 1981 through 1983, increased to its highest level in 1984, and then began to decline (Figure 1). In 1990, the national abortion ratio was the lowest recorded since 1977. Increased birth rates for women of all ages may have contributed to this decline (1). The national abortion rate increased each year through 1980, when it reached 25 abortions per 1,000 women ages 15–44 years. Since that time, the rate has remained stable, fluctuating from 23 to 24 abortions per 1,000 women ages 15–44 years (Figure 1).

In other countries, legal abortion rates range from a high of more than 100 abortions per 1,000 women of reproductive age (15–44 years) in the former Soviet Union to a low of 5 per 1,000 in the Netherlands (5). The induced abortion rate in the United States is higher than those reported by Australia, Canada, and Western European

TABLE 4. Reported legal abortions, by age and state of occurrence — selected states,\* United States, 1990

State	Age group (yrs)										No.	%				
	<15		15-19		20-24		25-29		30-34							
	No.	%	No.	%	No.	%	No.	%	No.	%						
Arizona	75	0.5	3,156	20.0	4,869	30.8	3,467	22.0	2,049	13.0	1,015	6.4	229	1.5	923	5.8
Arkansas	52	0.9	1,601	26.9	1,995	33.5	1,181	19.8	647	10.9	365	6.1	98	1.6	16	0.3
Colorado	62	0.5	3,013	23.8	3,867	30.5	2,646	20.9	1,809	14.3	945	7.5	598	3.9	100	0.8
Dist. of Col.	234	1.2	3,467	17.4	6,196	31.0	4,894	24.5	2,893	14.5	1,295	6.5	598	3.0	392	2.0
Georgia	461	1.2	8,537	21.8	12,837	32.7	8,731	22.2	5,196	13.2	2,529	6.4	683	1.7	272	0.7
Hawaii	42	0.9	937	19.7	1,447	30.5	1,088	22.9	684	14.4	413	8.7	133	2.8	4	0.1
Idaho	11	0.8	3,233	23.2	4,113	30.5	3,003	21.2	1,956	14.0	1,380	12.9	344	2.4	0	0.0
Indiana	114	0.8	3,299	23.0	5,070	35.3	3,037	21.2	1,667	11.6	853	5.9	224	1.6	87	0.6
Kansas	61	0.8	2,103	29.3	3,137	32.4	1,346	18.7	790	11.0	626	5.9	124	1.4	87	0.6
Kentucky <sup>t</sup>	197	1.8	3,218	29.5	3,545	32.5	1,964	18.0	1,150	10.5	614	5.6	177	1.6	56	0.5
Louisiana	150	1.2	2,934	22.5	4,287	32.9	2,716	20.9	1,670	12.8	938	7.2	281	2.2	44	0.3
Maine	23	0.5	1,091	23.1	1,563	33.9	981	21.3	568	12.3	620	14.4	183	3.8	23	0.5
Maryland	214	1.0	4,808	21.4	7,599	33.9	5,199	23.2	2,900	12.9	1,380	6.2	325	1.4	0	0.0
Massachusetts	216	0.5	7,401	18.6	13,137	33.1	9,611	24.2	5,517	13.9	2,899	7.3	760	1.9	198	0.5
Michigan	310	0.9	8,986	24.8	11,892	32.9	7,484	20.7	4,576	12.6	2,313	6.4	564	1.6	58	0.2
Minnesota	74	0.4	3,756	21.9	5,860	34.2	3,734	22.5	2,146	12.5	1,138	6.6	295	1.7	153	0.9
Mississippi	119	1.7	1,847	27.0	2,207	32.3	1,311	19.2	797	11.6	1,414	6.1	133	1.9	14	0.2
Missouri	152	0.9	3,528	21.6	5,498	33.6	3,594	22.0	2,213	13.5	1,211	6.8	257	1.6	32	0.2
Montana	21	0.6	914	27.9	1,981	29.2	666	19.8	458	13.6	245	7.9	78	2.3	0	0.0
Nebraska	41	0.6	1,772	27.9	2,102	33.1	1,199	18.9	738	11.6	377	5.9	112	1.8	5	0.1
Nevada	23	0.3	1,239	17.1	2,213	30.6	1,847	25.6	1,139	15.8	578	8.0	150	2.1	35	0.5
New Jersey	313	0.2	8,635	17.9	14,246	34.4	9,537	23.1	5,340	12.9	4,979	6.0	756	1.8	34	0.1
New Mexico	49	0.2	1,240	23.4	1,609	30.4	1,089	20.6	730	13.8	405	7.7	142	2.7	24	0.5
New York (City)	1,102	0.7	29,729	18.7	50,399	31.7	38,070	23.9	23,132	14.5	11,561	7.3	3,282	2.1	1,823	1.1
(State)	336	0.6	16,787	16.4	31,173	30.5	25,934	25.4	16,122	15.5	7,906	7.4	2,020	2.2	1,312	1.3
N. Carolina	398	1.1	9,327	25.6	12,555	34.4	7,188	19.8	3,945	10.8	2,017	5.5	521	1.4	573	1.6
N. Dakota	3	0.2	472	27.4	578	33.5	338	19.6	1,171	9.9	1,119	6.9	42	2.4	0	0.0
Ohio	130	0.4	6,018	18.7	10,569	23.4	6,445	20.0	3,882	12.1	631	6.0	2,550	7.9	1,128	0.9
Oregon	75	0.5	3,192	23.4	4,407	32.3	2,830	20.7	1,765	12.9	973	7.1	288	1.4	13,658	100.0
Pennsylvania	484	0.9	12,052	23.1	17,556	33.7	10,824	20.8	6,822	13.1	3,503	6.7	902	1.7	0	0.0
Rhode Island	50	0.6	1,560	20.0	2,760	36.5	1,643	14.0	1,086	14.0	540	6.5	130	1.7	13	0.2
S. Carolina	120	0.9	3,222	24.3	4,565	34.4	2,862	21.1	1,619	12.5	725	6.5	171	1.3	0	0.0
Tennessee	226	1.1	5,273	26.7	7,295	31.2	4,364	21.5	1,691	12.8	135	7.6	22	2.3	0	0.0
Texas	472	0.5	17,543	18.9	31,190	33.7	21,735	23.5	13,092	14.1	6,377	6.9	1,962	2.1	2,09	0.2

TABLE 4. Reported legal abortions, by age and state of occurrence — selected states,\* United States, 1990 — Continued

State	Age group (yrs)										Total No. %	
	<15		15-19		20-24		25-29		30-34			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Utah	37	0.8	1,105	23.1	1,589	33.2	1,027	21.5	620	13.0	295	6.2
Vermont	14	0.4	785	24.7	1,025	32.2	669	21.0	373	11.7	243	7.6
Virginia	238	0.7	7,192	21.8	10,912	33.1	7,336	22.2	4,424	13.4	2,226	6.7
Washington	174	0.6	6,675	21.2	10,117	32.2	7,136	22.7	4,486	14.2	2,221	7.1
W. Virginia	21	0.8	696	27.8	831	33.2	476	19.0	260	10.4	169	6.8
Wisconsin	139	0.8	4,106	24.4	5,893	35.0	3,426	20.3	2,028	12.0	983	5.8
Wyoming	3	0.8	99	27.3	127	35.0	64	17.6	42	11.6	21	5.8
<b>Total</b>	<b>6,709</b>	<b>0.8</b>	<b>187,104</b>	<b>21.4</b>	<b>288,140</b>	<b>32.9</b>	<b>194,182</b>	<b>22.2</b>	<b>116,300</b>	<b>13.3</b>	<b>58,479</b>	<b>6.7</b>
Abortion ratio <sup>3</sup>	844		515		377		220		191		273	
Abortion rate <sup>4</sup>	1		30		43		26		15		8	
											3	
											302	
											18	

\*All 40 states for which data are available, the District of Columbia, and New York City.

<sup>1</sup>Redistributed based on known distribution for 6 months of data.

<sup>2</sup>Calculated as the number of legal abortions obtained by women in a given age group per 1,000 live births to women in the same age group for these states. For each state, abortions obtained by women of unknown age are distributed according to the known age distribution for that state. Excludes states reporting age unknown for >15% of women having abortions.

<sup>3</sup>Calculated as the number of legal abortions obtained by women in a given age group per 1,000 women in the same age group for these states. For each state, abortions obtained by women of unknown age are distributed according to the known age distribution for that state. Excludes states reporting age unknown for >15% of women having abortions.

**TABLE 5. Reported legal abortions obtained by teenagers, by age and state of occurrence — selected states,\* United States, 1990**

State	Age (yrs)										Total No. %	Total No. %
	<15 No. %	15 No. %	16 No. %	17 No. %	18 No. %	19 No. %						
Arizona	75	2.3	204	6.3	355	11.0	524	16.2	969	30.0	1,104	34.2
Arkansas	52	3.1	93	5.6	173	10.5	242	14.6	583	35.3	510	30.9
Colorado	62	2.0	208	6.8	398	12.9	676	22.0	825	27.2	896	29.1
Georgia	461	5.1	643	7.1	1,078	12.0	1,654	18.4	2,376	26.4	2,786	31.0
Hawaii	42	4.3	91	9.3	137	14.0	196	20.0	238	24.3	275	28.1
Idaho	11	3.3	21	6.3	45	13.5	58	17.4	941	28.4	1,044	31.1
Indiana	114	3.3	231	6.8	333	9.8	447	13.1	1,041	30.5	1,247	36.5
Kansas	61	2.8	164	7.6	337	15.6	430	19.8	843	25.9	612	28.3
Kentucky <sup>†</sup>	197	5.8	231	6.8	469	13.7	662	19.4	843	24.7	1,013	29.7
Louisiana	150	4.9	192	6.2	334	10.8	369	12.0	1,001	32.5	1,038	33.7
Maine	23	2.1	67	6.0	141	12.7	236	21.2	212	24.3	376	33.8
Maryland	214	4.3	334	6.7	644	12.8	884	17.6	1,328	26.4	1,678	32.2
Massachusetts	216	2.8	376	4.9	704	9.2	1,172	15.4	2,311	30.3	2,838	37.3
Michigan	310	3.3	561	6.0	1,447	12.3	1,802	19.4	2,553	27.5	2,923	31.4
Minnesota	74	1.9	228	6.0	426	11.1	661	17.3	1,067	27.9	1,374	35.9
Mississippi	119	6.1	158	8.0	287	14.6	357	18.2	506	25.7	539	27.4
Missouri	152	4.1	263	7.1	384	10.4	466	12.7	1,089	29.6	1,326	32.2
Montana	21	2.2	54	5.8	126	13.5	191	20.4	1,267	28.6	1,276	29.5
Nebraska	41	2.3	112	6.2	208	11.5	347	19.1	531	29.3	574	31.7
Nevada	25	2.0	67	5.3	164	13.0	244	19.3	371	32.7	413	32.7
New Jersey	313	3.5	578	6.5	1,027	11.5	1,616	18.1	2,472	27.6	2,942	32.9
New Mexico	149	3.8	91	7.1	1,180	14.0	1,230	17.8	2,347	26.9	2,392	30.4
New York (City)	1,102	3.6	1,902	6.2	3,728	12.1	5,678	18.4	8,294	26.9	10,127	32.8
(State)	766	4.4	1,230	7.0	2,212	12.6	3,231	18.4	4,463	25.4	5,651	32.2
N. Carolina	336	2.5	672	5.1	1,516	11.4	2,447	18.4	3,831	28.9	4,476	33.7
N. Dakota	398	4.1	610	6.3	1,215	12.5	1,835	18.9	2,647	27.2	3,020	31.1
Ohio	130	2.1	18	3.8	38	8.0	63	13.3	176	37.1	177	37.3
Oregon	75	2.3	207	4.2	609	9.9	1,073	17.5	1,726	28.1	2,353	38.3
Pennsylvania	484	3.9	822	6.6	1,516	12.1	2,423	16.5	4,894	27.4	5,013	31.9
Rhode Island	50	3.1	95	5.9	151	9.4	185	11.5	498	30.9	631	39.2
S. Carolina	120	3.6	187	5.6	350	10.5	646	15.9	955	28.6	1,084	32.4
S. Dakota	7	2.7	14	5.4	46	10.7	52	20.0	66	25.4	75	26.0
Tennessee	226	4.1	393	7.1	718	13.1	958	17.4	1,496	27.2	1,708	31.1
Texas	422	2.6	904	5.0	1,967	10.9	3,188	17.7	4,926	27.3	6,557	36.4

**TABLE 5. Reported legal abortions obtained by teenagers, by age and state of occurrence — selected states,\* United States, 1990 — Continued**

State	Age (yrs)						Total No. %	Total No. %
	<15 No. %	15 No. %	16 No. %	17 No. %	18 No. %	19 No. %		
Utah	37	3.2	70	6.1	121	10.6	181	15.8
Vermont	14	1.8	51	6.4	93	11.6	156	32.4
Virginia	238	3.2	454	6.1	875	11.8	1,341	18.0
Washington	174	2.5	411	6.0	878	12.8	1,301	19.0
W. Virginia	21	2.9	51	7.1	83	11.6	114	15.9
Wyoming	3	2.9	6	5.9	12	11.8	13	12.7
<b>Total</b>	<b>6,336</b>	<b>3.4</b>	<b>11,418</b>	<b>6.1</b>	<b>21,920</b>	<b>11.8</b>	<b>33,056</b>	<b>17.8</b>
Abortion ratio <sup>§</sup>	821	622	563	502	28	41	465	514
Abortion rate <sup>¶</sup>	1	10	20	28	16	43	43	514

\* All 39 states for which data are available and New York City.

<sup>†</sup>Redistributed based on known distribution for 6 months of data.

<sup>§</sup>Calculated as the number of legal abortions obtained by women of a given age per 1,000 live births to women of the same age for these states.

<sup>¶</sup>Calculated as the number of legal abortions obtained by women of a given age per 1,000 women of the same age for these states.

TABLE 6. Reported legal abortions, by weeks of gestation and state of occurrence — selected states,\* United States, 1990

State	Weeks of gestation										Unknown No.	% No.	Total No.	% No.		
	≤8		9-10		11-12		13-15		16-20							
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Arkansas	3,340	56.1	4,437	24.1	577	9.7	260	4.4	83	1.4	237	4.0	5,953	100.0		
Colorado	4,496	35.5	4,653	36.6	2,348	15.8	1,511	7.6	426	3.4	55	0.4	12,679	100.0		
Dist. of Columbia	10,831	54.2	3,653	18.8	2,348	11.8	3,600	5.5	565	0.3	381	0.9	19,969	100.0		
Georgia	14,484	36.9	10,785	27.5	6,444	16.4	1,766	4.5	746	1.9	1,880	4.8	39,245	100.0		
Hawaii <sup>†</sup>	2,109	44.4	1,138	577	12.2	373	7.9	390	8.2	54	1.1	107	2.3	4,748	100.0	
Idaho	635	45.7	470	33.8	260	18.7	15	1.1	8	0.6	1	0.1	1	1.390	100.0	
Indiana	10,308	71.8	2,795	19.5	760	5.3	97	0.7	21	0.1	0	0	370	2.6	14,351	100.0
Kansas <sup>‡</sup>	2,783	38.7	1,955	21.2	1,041	14.5	589	5.2	522	7.3	272	3.8	24	0.3	7,186	100.0
Kentucky <sup>**</sup>	5,073	48.5	2,177	19.9	1,298	11.1	901	8.3	1,009	9.2	379	3.5	84	0.8	10,921	100.0
Louisiana	5,526	42.4	4,113	31.6	1,570	12.1	792	6.1	831	6.4	141	1.1	47	0.4	13,020	100.0
Maine <sup>§</sup>	2,317	50.3	1,314	28.5	586	12.7	320	6.9	37	0.8	0	0	33	0.7	4,607	100.0
Maryland <sup>¶</sup>	11,676	52.1	5,838	26.0	2,874	12.8	1,223	5.5	736	3.3	19	0.1	59	0.3	22,425	100.0
Michigan	21,016	58.1	7,736	21.4	3,264	9.3	2,688	7.4	1,284	3.5	92	0.3	3	0.0	36,183	100.0
Minnesota	8,327	48.5	4,544	26.5	2,153	12.5	2,097	6.4	878	5.1	85	0.5	72	0.4	17,156	100.0
Missouri <sup>  </sup>	3,287	48.0	1,887	27.6	949	13.9	413	6.0	107	1.6	10	0.1	189	2.8	6,842	100.0
Montana <sup>¶</sup>	6,458	39.5	5,313	32.5	2,775	17.0	1,195	7.3	568	3.5	47	0.3	10	0.1	16,366	100.0
Nevada	2,049	60.9	6,000	17.8	3,665	10.8	2,13	6.2	129	3.8	0	0	9	0.3	33,365	100.0
New Jersey <sup>¶</sup>	4,537	81.2	1,374	19.0	667	9.2	390	5.4	214	3.0	1	0.0	43	0.6	7,226	100.0
New Mexico	21,367	51.7	8,357	20.2	3,469	8.4	4,366	10.6	3,241	7.4	758	1.8	574	0.0	41,358	100.0
New York	2,613	49.4	1,012	19.1	454	8.6	331	6.3	273	5.2	31	0.6	574	10.9	5,288	100.0
(City)	79,604	50.0	38,026	23.9	18,078	11.4	10,115	6.4	6,742	4.2	2,081	1.3	4,452	2.8	159,098	100.0
(State)	50,647	49.6	23,427	22.9	11,519	11.3	6,683	6.5	5,245	5.1	1,865	1.8	2,816	2.3	102,202	100.0
Pennsylvania	28,957	50.9	14,599	25.7	6,559	11.5	3,432	6.0	1,497	2.6	216	0.4	1,636	2.9	56,896	100.0
Rhode Island <sup>¶</sup>	17,939	49.2	8,840	24.2	4,783	13.1	2,633	7.2	883	2.4	73	0.4	1,343	3.7	36,494	100.0
S. Carolina	937	54.4	4,422	24.5	1,191	11.1	1,153	8.9	14	0.8	0	0	6	0.3	1,723	100.0
N. Dakota <sup>¶</sup>	6,050	44.3	4,378	32.1	1,508	11.0	742	5.4	528	3.9	221	1.6	231	1.7	13,658	100.0
Oregon	25,568	49.0	14,147	27.1	6,890	13.2	3,250	6.2	1,793	3.4	420	0.8	75	0.1	52,143	100.0
Pennsylvania	4,541	58.4	1,927	24.8	6,655	8.4	4,431	5.5	1,191	2.5	11	0.1	26	0.3	7,782	100.0
Rhode Island <sup>¶</sup>	7,514	56.6	3,672	27.6	1,806	12.1	272	7.1	7	0.5	32	0.2	119	0.9	13,285	100.0
S. Dakota	608	64.3	2,621	27.7	1,702	7.6	4	0.4	0	0.0	0	0.0	0	0.0	946	100.0
Tennessee <sup>¶</sup>	10,775	51.0	5,998	28.4	2,699	12.8	1,426	6.7	208	1.0	18	0.1	20	0.1	21,144	100.0
Texas <sup>¶</sup>	48,410	52.3	22,204	24.0	10,176	11.0	6,159	6.7	4,223	4.6	1,294	1.4	113	0.1	92,580	100.0
Utah	3,168	66.2	756	15.8	386	8.1	226	4.7	170	3.6	4	0.1	76	1.6	4,786	100.0
Vermont	1,698	53.3	961	30.2	375	11.8	126	4.0	17	0.5	6	0.2	1	0.0	3,184	100.0
Virginia <sup>¶</sup>	19,882	60.3	8,794	26.7	2,974	9.0	473	1.4	649	2.0	128	0.4	92	0.3	32,992	100.0

**TABLE 6. Reported legal abortions, by weeks of gestation and state of occurrence — selected states,\* United States, 1990—Continued**

State	Weeks of gestation						Unknown No.	Unknown %	Total No.	Total %
	≤8 No.	≤8 %	9-10 No.	9-10 %	11-12 No.	11-12 %				
Washington <sup>§</sup>	18,973	60.3	7,381	23.5	2,344	7.6	1,205	3.8	284	0.9
W. Virginia <sup>††</sup>	585	23.4	1,092	43.7	575	23.0	178	7.1	61	2.4
Wisconsin	8,225	48.8	4,411	26.2	2,087	12.4	1,256	7.5	684	4.1
Wyoming <sup>¶</sup>	176	48.5	152	41.9	34	9.4	0	0.0	0	0.0
<b>Total</b>	<b>397,865</b>	<b>50.9</b>	<b>194,659</b>	<b>24.9</b>	<b>89,965</b>	<b>11.5</b>	<b>49,520</b>	<b>6.3</b>	<b>30,849</b>	<b>3.9</b>
							<b>7,604</b>	<b>1.0</b>	<b>10,785</b>	<b>1.4</b>
									<b>781,247</b>	<b>100.0</b>

\* All 36 states for which data are available, the District of Columbia, and New York City; excludes two states where unknown gestational age is >15%.

<sup>†</sup>Includes 16–19 weeks only.

<sup>‡</sup>Includes ≥20 weeks gestation.

<sup>§</sup>Weeks of gestation are based on physician's estimate.

<sup>¶</sup>Redistributed based on known distribution for 6 months of data.

<sup>††</sup>Weeks of gestation are based on physician's estimate if date of last menstrual period is unknown.

TABLE 7. Reported legal abortions, by type of procedure and state of occurrence — selected states,\* United States, 1990

State	Procedure												Total									
	Suction curettage			Sharp curettage			All curettage			Intrauterine instillation			Prostaglandin saline instillation			Hysterotomy/hysterectomy			Other†			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Arizona	14,945	94.7	14	0.1	14,959	94.8	5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	819	5.2	15,783	100.0		
Arkansas	5,737 <sup>‡</sup>	96.4	71	1.2	5,808	97.6	2	0.0	15	0.3	3	0.1	38	0.6	87	1.5	5,953	100.0				
Colorado	12,447	98.2	20	0.2	12,467	98.3	4	0.0	50	0.4	1	0.0	0	0.0	12	0.7	1,267	100.0				
Dist. of Col.	19,610	98.2	24	0.1	19,634	98.3	2	0.0	0	0.0	0	0.0	25	0.1	308	1.5	19,969	100.0				
Georgia	34,114 <sup>§</sup>	86.9	4,130	10.5	38,244	97.4	11	0.0	957	2.4	3	0.0	0	0.0	30	0.1	39,245	100.0				
Hawaii	4,642	97.8	19	0.4	4,661	98.2	0	0.0	11	0.2	0	0.0	53	1.1	23	0.5	4,748	100.0				
Idaho	1,387 <sup>¶</sup>	99.8	1	0.1	1,388	99.9	2	0.1	0	0.0	0	0.0	0	0.0	0	0.0	1,390	100.0				
Indiana	14,033 <sup>§</sup>	97.8	10	0.1	14,043	97.9	2	0.0	0	0.0	2	0.0	228	1.6	76	0.5	14,351	100.0				
Kansas	99.9	4	1,180	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7,186	100.0				
Kentucky <sup>¶</sup>	10,717	98.1	16	0.1	10,733	98.3	4	0.0	13	0.1	2	0.0	18	0.2	151	1.4	10,921	100.0				
Louisiana	12,820 <sup>¶</sup>	98.5	71	0.5	12,891	99.0	0	0.0	0	0.0	1	0.0	0	0.0	128	1.0	13,020	100.0				
Maine	4,350	95.3	207	4.7	4,597	98.8	4	0.0	2	0.0	0	0.0	4	0.0	0	0.0	4,607	100.0				
Maryland	21,692	96.7	148	0.7	21,840	97.4	130	0.6	303	1.4	2	0.0	149	0.7	1	0.0	22,425	100.0				
Massachusetts	38,133	96.0	493	1.2	38,626	97.2	24	0.1	591	1.5	0	0.0	498	1.3	0	0.0	39,739	100.0				
Michigan	36,123 <sup>¶</sup>	99.8	0	0.0	36,123	99.8	2	0.0	57	0.2	0	0.0	1	0.0	0	0.0	36,183	100.0				
Minnesota	17,146 <sup>¶</sup>	99.9	5	0.0	17,151	100.0	1	0.0	2	0.0	0	0.0	2	0.0	0	0.0	17,156	100.0				
Mississippi	6,806 <sup>¶</sup>	99.5	1	0.0	6,807	99.5	2	0.0	26	0.4	4	0.1	1	0.0	2	0.0	6,842	100.0				
Missouri	16,248 <sup>¶</sup>	99.3	10	0.1	16,268	99.3	0	0.0	29	0.2	0	0.0	45	0.3	34	0.2	16,386	100.0				
Montana	3,364	100.0	0	0.0	3,364	100.0	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	3,365	100.0				
Nebraska	6,254	98.5	2	0.0	6,256	98.6	0	0.0	0	0.0	23	0.4	13	0.2	56	0.9	6,348**	100.0				
Nevada	7,168 <sup>¶</sup>	99.2	11	0.2	7,179	99.3	1	0.0	2	0.0	0	0.0	0	0.0	44	0.6	7,226	100.0				
New Jersey	34,585	83.6	6,302	15.2	40,887	98.9	372	0.9	47	0.1	25	0.1	27	0.1	0	0.0	41,358	100.0				
New Mexico	4,903	92.7	36	0.7	4,939	93.4	298	5.6	0	0.0	0	0.0	1	0.0	50	0.9	5,288	100.0				
New York	142,917	89.8	1,339	0.8	144,256	90.7	1,375	0.9	251	0.2	7	0.0	331	0.2	12,878	8.1	159,098	100.0				
(City)	92,931 <sup>¶</sup>	90.9	1,070	1.0	94,001	92.0	1,058	1.0	55	0.1	5	0.0	41	0.0	7,042	6.9	102,202	100.0				
(State)	49,986 <sup>¶</sup>	87.9	269	0.5	50,285	88.3	317	0.6	196	0.3	2	0.0	290	0.5	5,836 <sup>††</sup>	10.3	56,896	100.0				
N. Carolina	35,319	96.8	99	0.3	35,418	97.1	223	0.6	239	0.7	9	0.0	238	0.7	367	1.0	36,494	100.0				
N. Dakota	1,719 <sup>¶</sup>	99.8	1	0.1	1,720	98.8	0	0.0	0	0.0	1	0.1	1	0.1	1	0.1	1,723	100.0				
Ohio	29,768	70.9	9,878 <sup>¶</sup>	23.5	39,646	94.4	0	0.0	0	0.0	7	0.0	1,335	3.2	1,018	2.4	42,006**	100.0				
Oregon	13,497 <sup>¶</sup>	98.8	12	0.1	13,509	98.9	1	0.0	3	0.0	5	0.0	24	0.2	116	0.8	13,658	100.0				
Pennsylvania	51,859 <sup>¶</sup>	99.5	26	0.0	51,885	99.5	15	0.0	28	0.1	4	0.0	211	0.4	0	0.0	52,143	100.0				
Rhode Island	7,736 <sup>¶</sup>	99.4	3	0.0	7,739	99.4	4	0.1	9	0.1	0	0.0	7	0.1	23	0.3	7,792	100.0				
S. Carolina	13,207	99.4	2	0.0	13,209	99.4	15	0.1	35	0.3	6	0.0	17	0.1	3	0.0	13,295	100.0				
S. Dakota	9,946	100.0	0	0.0	9,946	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	9,946	100.0				
Tennessee	2,089 <sup>¶</sup>	99.7	1	0.0	21,090	99.7	4	0.0	47	0.2	2	0.0	1	0.0	0	0.0	21,144	100.0				
Texas	9,188 <sup>¶</sup>	99.2	0	0.0	91,880	99.2	275	0.3	—	—	19	0.0	139	0.2	267	0.3	92,580	100.0				

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 TABLE 7. Reported legal abortions, by type of procedure and state of occurrence — selected states,\* United States, 1990 —  
 Continued

State	Procedure										Total No. %	
	Suction curettage		Sharp curettage		All curettage		Prostaglandin instillation		Hysterotomy/ hysterectomy			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Utah	4,369	91.3	391	8.2	4,760	99.5	1	0.0	1	0.0	17	0.4
Vermont	3,164	99.4	2	0.1	3,166	99.4	0	0.0	1	0.0	16	0.5
Virginia	31,805	96.4	27	0.1	31,832	96.5	38	0.1	68	0.2	3	0.0
Washington	31,319	99.6	8	0.0	31,327	99.6	8	0.0	97	0.3	50	0.2
W. Virginia	1,292	11.7	0	0.0	1,292	51.7	0	0.0	1,202	48.1	4	0.0
Wyoming	357	98.3	0	0.0	357	98.3	0	0.0	0	0.0	6	0.2
Total	816,887	94.1	23,384	2.7	840,071	96.8	2,825	0.3	4,087	0.5	135	0.0
											3,486	0.4
											17,571	2.0
											868,275	100.0

\* All 39 states for which data are available, the District of Columbia, and New York City.

† Includes instillation procedures not reported as a specific category and procedures reported as "other."

§ Includes dilation and evacuation procedures.

¶ Redistributed based on known distribution for 6 months of data.

\*\* Does not add to total abortions reported because of some reported combination procedures.  
 ¶ Approximately 4,000 of the unknown procedures were a combination of procedures for which the primary procedure could not be determined.

|| Reported as dilatation and curettage procedures.

— Not reported.

|| Includes prostaglandin combined with saline procedure.

countries and lower than those reported by the former Soviet Union, China, Cuba, and Eastern European countries (5). Abortion rates for teenagers are higher in the United States than in most Western European countries and in some Eastern European countries (5).

Abortion ratios vary widely by age. Although the abortion ratio was highest for teenagers, the percentage of legal abortions they obtained has steadily decreased since the mid-1980s—from 26% of all legal induced abortions in 1984 to 24% in

**TABLE 8. Reported legal abortions, by race and state of occurrence — selected states,\* United States, 1990**

State	Race									
	White†		Black		Other		Unknown		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Arizona	12,718	80.6	777	4.9	753	4.8	1,535	9.7	15,783	100.0
Arkansas	4,165	70.0	1,666	28.0	65	1.1	57	1.0	5,953	100.0
Dist. of Columbia	4,545	22.8	12,247	61.3	2,861	14.3	316	1.6	19,969	100.0
Georgia	20,548	52.4	17,209	43.9	1,488	3.8	0	0.0	39,245	100.0
Idaho	1,335	96.0	5	0.4	43	3.1	7	0.5	1,390	100.0
Indiana	10,605	73.9	3,143	21.9	220	1.5	383	2.7	14,351	100.0
Kansas	5,950	82.8	1,020	14.2	113	1.6	103	1.4	7,186	100.0
Kentucky‡	8,763	80.2	1,823	16.7	218	2.0	117	1.1	10,921	100.0
Louisiana	7,260	55.8	5,530§	42.5	—	—	230	1.8	13,020	100.0
Maine	4,434	96.2	57	1.2	116	2.5	0	0.0	4,607	100.0
Maryland	10,741	47.9	10,442	46.6	900	4.0	342	1.5	22,425	100.0
Minnesota	14,833	86.5	1,114	6.5	807	4.7	402	2.3	17,156	100.0
Mississippi	3,335	48.7	3,439	50.3	45	0.7	23	0.3	6,842	100.0
Missouri	10,350	83.2	5,682	34.7	298	1.8	36	0.2	16,366	100.0
Nevada	6,500	90.0	538	7.4	170	2.4	18	0.2	7,226	100.0
New Jersey	22,852	55.3	16,700	40.4	1,596	3.9	210	0.5	41,358	100.0
New Mexico	4,725	89.4	122	2.3	441	8.3	0	0.0	5,288	100.0
New York	85,733	53.9	62,559	39.3	4,235	2.7	6,571	4.1	159,098	100.0
(City)	43,984	43.0	51,359	50.3	3,639	3.6	3,220	3.2	102,202	100.0
(State)	41,749	73.4	11,200	19.7	596	1.0	3,351	5.9	56,896	100.0
N. Carolina	20,984	57.5	13,328	36.5	1,078	3.0	1,104	3.0	36,494	100.0
N. Dakota	1,582	91.8	23	1.3	117	6.8	1	0.1	1,723	100.0
Oregon	11,986	87.8	571	4.2	557	4.1	544	4.0	13,658	100.0
Rhode Island	6,430	82.6	913	11.7	343	4.4	96	1.2	7,782	100.0
S. Carolina	7,501	56.5	5,597	42.1	181	1.4	6	0.0	13,285	100.0
S. Dakota	865	91.4	12	1.3	69	7.3	0	0.0	946	100.0
Tennessee	13,784	65.2	6,865	32.5	205	1.0	290	1.4	21,144	100.0
Texas	70,689	76.4	18,427	19.9	3,218	3.5	246	0.3	92,580	100.0
Utah	4,384	91.6	100	2.1	260	5.4	42	0.9	4,786	100.0
Vermont	3,131	98.3	13	0.4	28	0.9	12	0.4	3,184	100.0
Virginia	20,436	61.9	11,424	34.6	952	2.9	180	0.5	32,992	100.0
W. Virginia	2,180	87.2	299	12.0	17	0.7	4	0.2	2,500	100.0
Wisconsin	13,209	78.4	3,187	18.9	418	2.5	34	0.2	16,848	100.0
Total	416,553	63.5	204,832	31.2	21,812	3.3	12,909	2.0	656,106	100.0
Abortion ratio**	258		521††		335§§				309	

\*All 30 states for which data are available, the District of Columbia, and New York City; excludes six states where unknown race is >15%.

†White race includes those of Hispanic ethnicity.

‡Redistributed based on known distribution for 6 months of data.

§Includes black and other races.

\*\*Calculated as the number of legal abortions obtained by women of a given race per 1,000 live births to women of the same race for these states. For each state, abortions obtained by women of unknown race were distributed according to known race distribution for that state. Excludes states reporting race unknown for >15% of women having abortions.

††Ratio for black race excludes Kentucky because live births for blacks and others were grouped together.

§§Ratio for other race excludes Louisiana because abortions for blacks and others were grouped together.

—Not reported.

1989 and to 22% in 1990 (2). Since 1980, the abortion ratio has declined for most age groups, particularly for the youngest and oldest women. Increasing rates of childbearing among teenagers and women  $\geq 35$  years old may account for some of the decline in abortion ratios in these age groups (1).

In 1990, the abortion ratio for black women continued to be about twice that for white women. Differences in abortion ratios by race may reflect differences in factors such as socioeconomic status, educational level, access to family planning and contraceptive services, and contraceptive use.

In 1990, the abortion ratio for Hispanic women was lower than for non-Hispanic white women. At all ages, Hispanic women have higher fertility than do non-Hispanic women (1). In contrast to our findings, other studies based on earlier data suggest that abortion rates for Hispanic women were higher than for non-Hispanic women (6).

Several other trends—not necessarily related to each other—were observed for women who obtained abortions from 1972 through 1990 (Table 1). During that time, the percentage of women obtaining an abortion in their state of residence increased from 56% to 92% and has remained stable at approximately 91%–92% since 1984. From 1972 through 1990, the percentage of women obtaining abortions who were unmarried increased steadily, from 70% to almost 80% in 1984; since then, the

**TABLE 9. Reported legal abortions, by Hispanic origin and state of occurrence — selected states,\* United States, 1990**

State	Hispanic		Total	
	No.	%	No.	%
Arizona	2,848	18.0	15,783	100.0
Arkansas	19	0.3	5,953	100.0
Georgia	394	1.0	39,245	100.0
Idaho	51	3.7	1,390	100.0
Kansas	170	2.4	7,186	100.0
Minnesota	154	0.9	17,156	100.0
Mississippi	11	0.2	6,842	100.0
Missouri	159	1.0	16,366	100.0
Nevada	273	3.8	7,226	100.0
New Jersey	5,780	14.0	41,358	100.0
New Mexico	2,111	39.9	5,288	100.0
New York	25,293	15.9	159,098	100.0
(City)	23,288	22.8	102,202	100.0
(State)	2,005	3.5	56,896	100.0
North Dakota	13	0.8	1,723	100.0
Oregon	431	3.2	13,658	100.0
Rhode Island	55	0.7	7,782	100.0
South Carolina	104	0.8	13,285	100.0
Tennessee	107	0.5	21,144	100.0
Texas	23,364	25.2	92,580	100.0
Utah	316	6.6	4,786	100.0
Vermont	22	0.7	3,184	100.0
Virginia	830	2.5	32,992	100.0
Wisconsin	529	3.1	16,848	100.0
Total	63,034	11.9	530,873	100.0
Abortion ratio†	258		320	

\*All 22 states for which data are available and New York City.

†Calculated as the number of legal abortions obtained by women of Hispanic origin per 1,000 live births to women of Hispanic origin for these states.

percentage has remained about 78%–81% (2). The number of women having abortions who had had one or no previous live births increased from 68% in 1972 to 73% in 1977 and has remained at 74%–78% since that time.

The percent distribution of abortions by gestational age has been relatively stable since 1978, although some changes have occurred in the percentage of women obtaining legal abortions either early ( $\leq 8$  weeks) or late ( $\geq 16$  weeks) in gestation (Table 1). Previous reports have found, as did this study, that age is inversely corre-

**TABLE 10. Reported legal abortions, by marital status and state of occurrence — selected states,\* United States, 1990**

State	Marital status						Total	
	Married†		Unmarried‡		Unknown			
	No.	%	No.	%	No.	%	No.	%
Arkansas	1,227	20.6	4,540	76.3	186	3.1	5,953	100.0
Colorado	2,498	19.7	9,971	78.6	210	1.7	12,679	100.0
Georgia	8,071	20.6	30,836	78.6	338	0.9	39,245	100.0
Hawaii	1,195	25.2	3,501	73.7	52	1.1	4,748	100.0
Idaho	329	23.7	1,057	76.0	4	0.3	1,390	100.0
Indiana	2,792	19.5	11,226	78.2	333	2.3	14,351	100.0
Kansas	1,373	19.1	5,813	80.9	0	0.0	7,186	100.0
Kentucky§	1,942	17.8	8,770	80.3	209	1.9	10,921	100.0
Maine	939	20.4	3,449	74.9	219	4.8	4,607	100.0
Maryland	4,756	21.2	16,698	74.5	971	4.3	22,425	100.0
Massachusetts	8,488	21.4	26,992	67.9	4,259	10.7	39,739	100.0
Michigan	6,452	17.8	29,406	81.3	325	0.9	36,183	100.0
Minnesota	3,225	18.8	13,232	77.1	699	4.1	17,156	100.0
Mississippi	1,322	19.3	5,489	80.2	31	0.5	6,842	100.0
Missouri	3,542	21.6	12,609	77.0	215	1.3	16,366	100.0
Montana	631	18.8	2,477	73.6	257	7.6	3,365	100.0
Nevada	1,868	25.9	5,256	72.7	102	1.4	7,226	100.0
New Jersey	8,681	21.0	32,536	78.7	141	0.3	41,358	100.0
New Mexico	1,058	20.0	4,161	78.7	69	1.3	5,288	100.0
New York (City)	22,532	22.0	77,019	75.4	2,651	2.6	102,202	100.0
N. Carolina	8,537	23.4	26,880	73.7	1,077	3.0	36,494	100.0
N. Dakota	340	19.7	1,382	80.2	1	0.1	1,723	100.0
Ohio	5,515	17.1	24,057	74.8	2,593	8.1	32,165	100.0
Oregon	3,332	24.4	10,132	74.2	194	1.4	13,658	100.0
Rhode Island	1,800	23.1	5,911	76.0	71	0.9	7,782	100.0
S. Carolina	2,817	21.2	10,433	78.5	35	0.3	13,285	100.0
S. Dakota	190	20.1	756	79.9	0	0.0	946	100.0
Tennessee	4,398	20.8	16,626	78.6	120	0.6	21,144	100.0
Texas	22,284	24.1	69,417	75.0	879	0.9	92,580	100.0
Utah	1,811	37.8	2,975	62.2	0	0.0	4,786	100.0
Vermont	696	21.9	2,251	70.7	237	7.4	3,184	100.0
Virginia	6,094	18.5	25,874	78.4	1,024	3.1	32,992	100.0
W. Virginia	530	21.2	1,967	78.7	3	0.1	2,500	100.0
Wisconsin	2,523	15.0	14,232	84.5	93	0.6	16,848	100.0
Wyoming	91	25.1	272	74.9	0	0.0	363	100.0
Total	143,879	21.2	518,203	76.2	17,598	2.6	679,680	100.0
Abortion ratio**	89		879				298	

\*All 34 states for which data are available and New York City; excludes three states where unknown marital status is >15%.

†Married includes married and separated, unless otherwise specified.

‡Unmarried includes never married, divorced, and widowed, unless otherwise specified.

§Redistributed based on known distribution for 6 months of data.

\*\*Calculated as the number of legal abortions obtained by women of a given marital status per 1,000 live births to women of the same marital status for these states. For each state, abortions obtained by women of unknown marital status are distributed according to known marital status distribution for that state. Excludes states reporting marital status unknown for >15% of women having abortions. Also excludes Michigan and Nevada because they do not have denominator data.

lated with the timing of abortion (i.e., younger women were more likely to obtain abortions later in gestation than were older women) (2,7,8).

The percentage of women having abortions who did so for the first time decreased from 75% in 1974 to 56% in 1990 (Table 12) (9). During this 15-year period, the percentage of women who had previously had one induced abortion increased from 10% in 1974 to 26% in 1988 and remained at that level in 1990. The percentage who had had two previous abortions increased from about 1% in 1974 to approximately 10% in 1985 and has remained at about 9%–10% since that time. The percentage who had had three or more abortions increased from 0.4% in 1974 to approximately 5% in 1985 and to 6% in 1990. These increases in the early to mid-1980s probably reflected the increasing number of women at risk of having had an abortion and the greater likelihood that women who have had one abortion are more likely to have another abortion when compared with women who have never had one (10,11).

During the period 1972–1990, the percentage of abortions performed by curettage increased from 89% to 99% (Table 1). Surveillance during the same period showed a sharp decline in the percentage of abortions performed by intrauterine instillation (from 10% to 1%) and by hysterectomy and hysterotomy (from 0.6% to 0.02%).

From 1974 through 1990, the percentage of second-trimester abortions performed by D&E increased from 31% to 93%; the percentage of second-trimester abortions performed by intrauterine instillation decreased from 57% to 5% (9). The increasing use of D&E may have resulted from the improved technology and the lower risk of complications associated with the procedure (12,13).

The number of legal abortions reported to CDC in 1990 was probably lower than the number actually performed. Totals provided by central health agencies are often lower than those obtained by direct surveys of abortion providers (14). For example, the total number of abortions reported by CDC for 1988 was approximately 16% lower than that reported for the same year by the Alan Guttmacher Institute, a private organization that directly contacts abortion providers to obtain information on the number of abortions performed\* (15).

Despite these limitations, ongoing national surveillance of legal induced abortion is important for several reasons. For example, abortion surveillance is used to identify characteristics of women at high risk of unintended pregnancy. Ongoing surveillance is essential to monitor trends in the number, ratio, and rate of abortions in the United States. Statistics on the number of pregnancies ending in abortion are needed to combine with birth statistics to provide an estimate of pregnancy rates (e.g., pregnancy rates among teenagers [16]) and to calculate other outcome rates (e.g., the rate of ectopic pregnancies per 1,000 pregnancies). In turn, abortion and pregnancy rates can be used to evaluate the effectiveness of family planning programs and other programs to prevent unintended pregnancy. Ongoing surveillance also allows an opportunity to assess changes in clinical practice patterns related to abortion (e.g., changes in types of procedure over time). Finally, abortion data are used as denominators to calculate abortion morbidity rates and mortality case-fatality rates.

Induced abortions usually are linked to unintended pregnancies, which often occur despite the use of contraception (6,17,18). In the mid-1980s, about 1.2 million live births occurred as a result of unintended pregnancy (i.e., the pregnancy was either mistimed or unwanted at conception) (19). Improving contraceptive practice, as well

\*1988 was the last year in which national abortion survey data were reported by the Alan Guttmacher Institute.

TABLE 11. Reported legal abortions, by number of previous live births and state of occurrence — selected states,\* United States, 1990

State	Number of previous live births										Total No. %		
	0		1		2		3		≥4				
	No.	%	No.	%	No.	%	No.	%	No.	%			
Arizona	7,095	45.0	3,679	23.3	2,579	16.7	1,116	7.1	600	3.8	714	4.5	
Arkansas	2,846	47.8	1,627	22.3	996	16.7	325	5.5	122	2.0	37	0.6	
Colorado	7,233	57.0	2,567	20.2	1,904	15.0	665	5.2	251	2.0	59	0.5	
Georgia	19,979	50.9	9,996	25.5	6,125	15.6	2,000	836	2.1	309	0.8	39,245	100.0
Hawaii	2,265	47.7	1,031	21.7	861	18.1	294	6.2	156	3.3	141	3.0	
Idaho	686	49.4	310	22.3	238	17.1	103	7.4	48	3.5	5	0.4	
Indiana	6,924	48.2	3,539	26.7	2,533	17.8	794	5.5	354	2.5	204	1.4	
Kansas	4,102	57.1	1,516	21.1	1,036	14.8	354	4.9	137	1.9	111	0.2	
Kentucky†	5,934	54.3	2,554	23.4	1,507	13.8	484	4.4	242	2.2	200	1.8	
Maine	2,584	56.1	952	20.7	665	14.4	207	4.5	75	1.6	124	2.7	
Maryland	10,426	46.5	5,978	26.7	3,819	17.0	1,212	5.4	621	2.8	369	1.6	
Michigan	17,615	48.7	8,908	24.6	6,283	17.4	2,260	6.2	1,109	3.1	8	0.0	
Minnesota	9,841	57.4	3,366	19.6	2,532	14.8	906	5.3	509	3.0	0	0.0	
Mississippi	3,204	46.8	1,843	26.9	1,577	17.2	427	6.2	188	2.7	3	0.0	
Missouri	7,472	45.7	4,287	26.2	2,950	18.0	1,125	6.9	346	2.1	186	1.1	
Montana	1,908	56.7	615	18.3	521	15.5	222	6.6	99	2.9	0	0.0	
Nebraska	3,527	55.6	1,253	19.8	998	15.7	400	6.3	163	2.6	0	0.0	
Nevada	1,190	44.1	1,876	26.0	1,382	19.1	455	6.3	265	3.7	58	0.8	
New Jersey	18,149	43.9	10,949	26.5	8,059	19.5	2,856	6.9	1,345	3.3	0	0.0	
New Mexico	2,588	48.9	1,262	23.9	850	16.1	344	6.5	148	2.8	96	1.8	
New York (City)	68,731	43.2	37,617	23.6	28,036	17.6	11,282	7.1	6,476	4.1	6,956	4.4	
(State)	36,254	35.5	26,137	25.6	19,549	19.1	8,119	8.0	5,177	5.1	6,956	6.8	
32,477	57.1	11,480	20.2	8,487	14.9	3,133	5.5	1,299	2.3	0	0.0		
*7,882	49.0	8,322	22.9	4,791	13.1	1,511	4.1	3,958	10.8	0	0.0		
N. Dakota	1,004	58.3	286	16.6	265	15.4	115	6.7	53	3.1	0	0.0	
Oregon	6,615	48.4	3,004	22.0	2,337	17.1	811	5.9	372	2.7	519	3.8	
Pennsylvania	26,725	51.3	12,679	24.3	8,492	16.3	2,923	5.6	1,276	2.4	48	0.1	
Rhode Island	4,327	55.6	1,665	21.4	1,145	14.7	436	5.6	202	2.6	7	0.1	
S. Carolina	6,687	50.3	3,578	26.9	2,064	15.5	701	5.3	251	1.9	4	0.0	
S. Dakota	522	55.2	185	17.4	160	16.9	76	8.0	23	2.4	0	0.0	

**TABLE 11. Reported legal abortions, by number of previous live births and state of occurrence — selected states,\* United States, 1990 — Continued**

State	Number of previous live births										Total No. %	
	0		1		2		3		≥4			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Tennessee	10,635	50.3	5,671	26.8	3,343	15.8	1,048	5.0	431	2.0	16	0.1
Texas	45,298	48.9	22,755	24.6	15,976	17.3	5,630	6.1	2,863	3.1	58	0.1
Utah	2,322	48.5	1,052	22.0	851	17.8	358	7.7	183	3.8	20	0.4
Vermont	1,931	60.6	568	17.8	470	14.8	141	4.4	71	2.2	23	0.1
Virginia	17,529	53.1	7,843	23.8	5,033	15.4	1,639	5.0	783	2.4	105	0.3
Washington	15,712	50.0	7,245	23.0	5,434	17.3	1,960	6.2	836	2.7	256	0.8
W. Virginia	1,323	52.9	687	26.3	332	13.3	136	5.4	45	1.8	7	0.3
Wyoming	185	51.0	77	21.2	70	19.3	19	5.2	10	2.8	2	0.6
<b>Total</b>	<b>364,996</b>	<b>48.4</b>	<b>181,327</b>	<b>24.1</b>	<b>125,907</b>	<b>16.7</b>	<b>45,335</b>	<b>6.0</b>	<b>25,447</b>	<b>3.4</b>	<b>10,527</b>	<b>1.4</b>
Abortion Ratio <sup>b</sup>	358	230	317	302	271						303	

\*All 36 states for which data are available and New York City; excludes two states where number of unknown previous live births is >15%.

<sup>a</sup>Redistributed based on known distribution for 6 months of data.

<sup>b</sup>Calculated as the number of legal abortions obtained by women with a given number of previous live births per 1,000 live births to women with the same number of previous live births for these states. For each state, abortions obtained by women whose number of previous live births is unknown are distributed according to known number of previous live births for that state. Excludes states reporting number of previous live births unknown for >15% of women having abortions.

**TABLE 12. Reported legal abortions, by number of previous induced legal abortions and state of occurrence — selected states,\* United States, 1990**

State	Number of previous induced abortions										Total No. %	
	0		1		2		≥3		Unknown			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Arizona	9,967	63.2	4,047	25.6	1,226	7.8	543	3.4	0	0.7	15,783 100.0	
Arkansas	4,122	69.2	1,386	23.3	302	5.1	100	1.7	43	0.7	5,953 100.0	
Colorado	7,739	61.0	3,255	25.7	1,076	8.5	534	4.2	75	0.6	12,679 100.0	
Dist. of Columbia	9,108	45.6	6,213	31.1	2,674	13.4	1,595	8.0	379	1.9	19,969 100.0	
Georgia	23,668	60.3	10,177	25.9	3,367	8.6	1,458	3.7	575	1.5	39,245 100.0	
Hawaii	2,340	49.3	1,243	26.2	597	12.6	442	9.3	126	2.7	4,748 100.0	
Idaho	1,030	74.1	256	18.4	73	5.3	26	1.9	5	0.4	1,390 100.0	
Indiana	9,209	64.2	3,435	23.9	990	6.9	417	2.9	300	2.1	14,351 100.0	
Kansas	4,703	65.4	1,769	24.6	505	7.0	193	2.7	16	0.2	7,186 100.0	
Kentucky <sup>†</sup>	7,167	65.6	2,408	22.0	579	5.3	229	2.1	538	4.9	10,921 100.0	
Maine	3,031	65.8	1,055	22.9	305	6.6	141	3.1	75	1.6	4,607 100.0	
Maryland	10,076	44.9	7,513	33.5	3,036	13.5	1,579	7.0	221	1.0	22,425 100.0	
Michigan	20,250	56.0	9,756	27.0	3,847	10.6	2,168	6.0	162	0.4	36,183 100.0	
Minnesota	10,973	66.0	4,444	24.2	1,323	7.6	714	4.2	2	0.0	1,156 100.0	
Mississippi	4,524	66.1	1,572	23.0	538	7.9	205	3.0	3	0.0	6,842 100.0	
Missouri	10,094	61.7	4,313	26.4	1,333	8.1	570	3.5	56	0.3	16,366 100.0	
Montana	2,373	70.5	7,712	21.2	179	5.3	101	3.0	0	0.0	3,365 100.0	
Nebraska	4,297	67.7	1,406	22.2	401	6.3	196	3.1	46	0.7	6,346 100.0	
Nevada	3,331	46.1	2,132	29.5	984	13.6	739	10.2	40	0.6	10,226 100.0	
New Jersey	19,687	47.6	12,358	29.9	5,638	13.6	3,685	8.9	0	0.0	41,736 100.0	
New Mexico	3,265	61.7	1,214	23.0	440	8.3	369	7.0	0	0.0	5,288 100.0	
New York (City)	72,972	45.9	42,051	26.4	21,681	13.6	15,321	9.6	7,073	4.4	159,093 100.0	
N. Carolina	40,061	39.2	29,211	28.6	16,847	16.5	12,834	12.6	3,249	3.2	102,202 100.0	
N. Dakota	32,911	57.8	12,840	22.6	4,834	8.5	2,487	4.4	3,824	6.7	56,895 100.0	
Oregon	21,990	60.3	8,854	24.3	2,460	6.7	949	2.6	2,241	6.1	36,494 100.0	
Pennsylvania	1,235	71.7	365	21.2	100	5.8	23	1.3	0	0.0	1,723 100.0	
Rhode Island	7,509	55.0	3,718	21.3	1,336	9.4	827	6.1	268	2.0	13,658 100.0	
S. Carolina	31,723	60.8	13,748	26.4	4,391	8.4	2,216	4.2	65	0.1	52,143 100.0	
S. Dakota	4,764	61.2	1,980	25.4	691	8.9	332	4.3	15	0.2	7,782 100.0	
Tennessee	8,625	64.9	3,396	25.6	908	8.1	363	2.7	3	0.1	13,285 100.0	
Texas	788	83.3	134	14.2	20	2.1	4	0.4	0	0.0	946 100.0	
Utah	13,823	65.4	5,070	24.0	1,542	7.3	691	3.3	18	0.1	21,144 100.0	
Vermont	57,009	61.6	24,690	26.7	7,474	8.1	3,252	3.5	155	0.2	92,580 100.0	
	3,077	64.3	1,155	24.1	337	4.2	199	4.2	18	0.4	4,786 100.0	
	1,983	62.3	773	24.3	284	8.9	139	4.4	5	0.2	3,184 100.0	

**TABLE 12. Reported legal abortions, by number of previous induced legal abortions and state of occurrence -- selected states,\* United States, 1990 — Continued**

State	Number of previous induced abortions						Total No. %					
	0		1		≥3							
	No.	%	No.	%	No.	%						
Virginia	19,376	58.7	8,738	26.5	2,717	8.2	2,099	6.4	62	0.2	32,992	100.0
Washington	16,802	53.4	8,602	27.4	3,488	11.1	2,288	7.3	263	0.8	31,443	100.0
W. Virginia	1,763	70.5	527	21.1	150	6.0	60	2.4	0	0.0	2,500	100.0
Wyoming	251	69.1	72	19.8	28	7.7	10	2.8	2	0.6	363	100.0
Total	434,654	56.2	204,237	26.4	77,020	10.0	44,747	5.8	12,850	1.7	773,508	100.0

\* All 36 states for which data are available, the District of Columbia, and New York City; excludes two states where number of unknown previous induced abortions is >15%.

† Redistributed based on known distribution for 6 months of data.

**TABLE 13. Number and percentage of reported legal abortions, by race, age group, and marital status — United States, 1990**

Age group/ marital status*	Race					
	White†		Black/other		Total	
	No.	%	No.	%	No.	%
<b>Age group (yrs)</b>						
<15	2,215	0.6	2,597	1.3	4,812	0.8
15–19	88,731	22.3	41,597	20.1	130,328	21.5
20–24	132,427	33.2	68,922	33.3	201,349	33.2
25–29	87,044	21.8	49,242	23.8	136,286	22.5
30–34	52,741	13.2	28,171	13.6	80,912	13.4
35–39	27,571	6.9	12,919	6.3	40,490	6.7
≥40	8,022	2.0	3,229	1.6	11,251	1.9
<b>Total§</b>	<b>398,751</b>	<b>100.0</b>	<b>206,677</b>	<b>100.0</b>	<b>605,428</b>	<b>100.0</b>
<b>Marital status</b>						
Married	80,883	23.8	36,770	19.3	117,653	22.2
Unmarried	259,627	76.2	153,523	80.7	413,150	77.8
<b>Total¶</b>	<b>340,510</b>	<b>100.0</b>	<b>190,293</b>	<b>100.0</b>	<b>530,803</b>	<b>100.0</b>

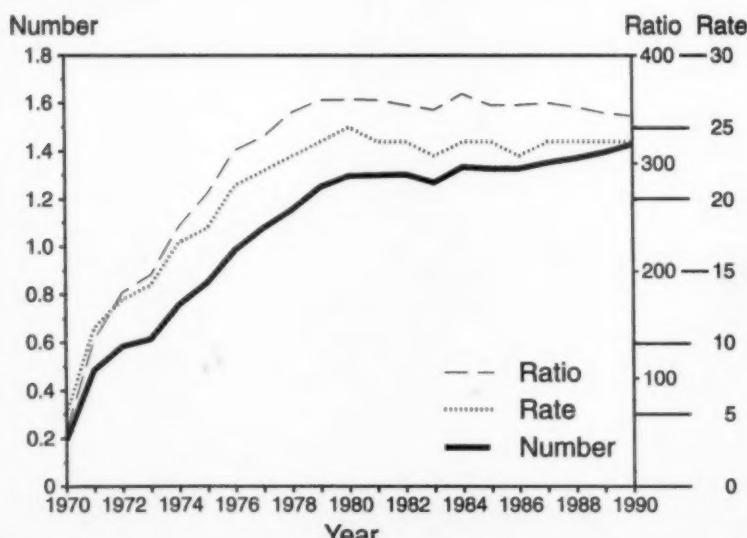
\*Excludes unknowns.

†Includes Hispanics.

§Reported by 30 states and New York City.

¶Reported by 28 states and New York City.

**FIGURE 1. Number,\* ratio,† and rate§ of legal abortions performed annually — United States, 1970–1990**



\*In millions.

†Per 1,000 live births.

§Per 1,000 women ages 15–44 years.

TABLE 14. Number and percentage of reported legal abortions, by weeks of gestation, age group, and race — United States, 1990

Age group/ race*	Weeks of gestation										Total No. %	
	<8		9-10		11-12		13-15		16-20			
	No.	%	No.	%	No.	%	No.	%	No.	%		
Age group (yrs)												
<15	2,090	36.5	1,423	24.9	932	16.3	605	10.6	512	8.9	160	
15-19	68,751	43.3	42,220	26.6	22,498	14.2	13,708	8.6	9,199	5.8	2,522	
20-24	12,711	50.0	63,124	26.1	29,793	12.3	16,317	6.7	9,513	3.9	2,329	
25-29	89,642	55.0	40,681	25.0	17,248	10.6	8,907	5.5	5,194	3.2	1,198	
30-34	57,220	58.5	23,504	24.0	9,282	9.5	4,484	4.6	2,658	2.7	678	
35-39	29,748	60.4	11,495	23.3	4,234	8.6	1,974	4.0	1,447	2.9	346	
≥40	8,380	61.6	3,114	22.9	1,077	7.9	538	4.0	407	3.0	92	
Total†	377,002	51.6	185,561	25.4	85,064	11.6	46,533	6.4	28,930	4.0	7,325	
Race												
White	206,679	54.0	96,095	25.1	41,463	10.8	21,720	5.7	13,238	3.5	3,766	
Black/other	93,584	46.1	52,655	26.0	27,745	13.7	16,020	7.9	10,328	5.1	2,550	
Total‡	300,263	51.3	148,750	25.4	69,208	11.8	37,740	6.4	23,566	4.0	6,316	

\*Excludes unknowns.

†Reported by 35 states and New York City.

‡Reported by 29 states and New York City.

TABLE 15. Number and percentage of reported legal abortions, by weeks of gestation and procedure — United States, 1990

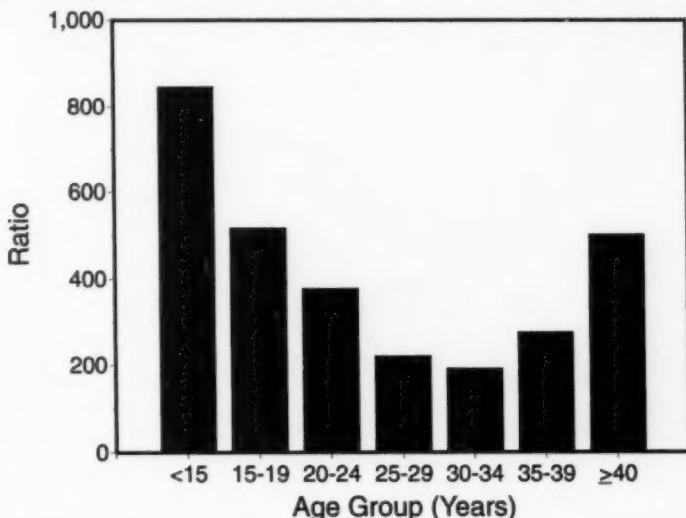
Type of procedure*	Weeks of gestation						Total No. %							
	$\leq 8$		9-10		11-12									
	No.	%	No.	%	No.	%								
Curettage (suction or sharp) <sup>†</sup>	370,588	99.8	182,383	99.6	83,280	99.4	44,731	98.2	24,799	87.7	5,953	83.4	711,734	99.0
Intrauterine saline instillation	65	0.0 <sup>‡</sup>	67	0.0 <sup>§</sup>	62	0.1	332	0.7	1,562	5.5	445	6.2	2,533	0.4
Intrauterine prostaglandin instillation	300	0.1	540	0.3	330	0.4	269	0.6	1,181	4.2	617	8.6	3,237	0.5
Hysterotomy/hysterectomy	49	0.0 <sup>¶</sup>	9	0.0 <sup>¶</sup>	8	0.0 <sup>¶</sup>	7	0.0 <sup>¶</sup>	17	0.1	7	0.1	97	0.0 <sup>¶</sup>
Other	330	0.1	69	0.0 <sup>§</sup>	95	0.1	223	0.5	714	2.5	117	1.6	1,548	0.2
<b>Total</b>	<b>371,332</b>	<b>100.0</b>	<b>183,068</b>	<b>100.0</b>	<b>83,775</b>	<b>100.0</b>	<b>45,562</b>	<b>100.0</b>	<b>28,273</b>	<b>100.0</b>	<b>7,139</b>	<b>100.0</b>	<b>719,149</b>	<b>100.0</b>

\*Excludes unknowns.

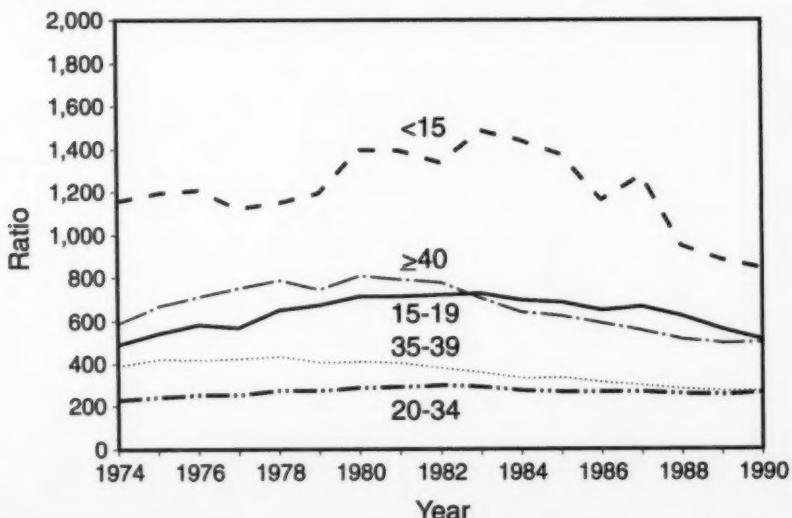
†Includes dilation and evacuation.

‡≤0.05%.

§Reported by 35 states and New York City.

**FIGURE 2. Abortion ratios,\* by age group — United States, 1990**

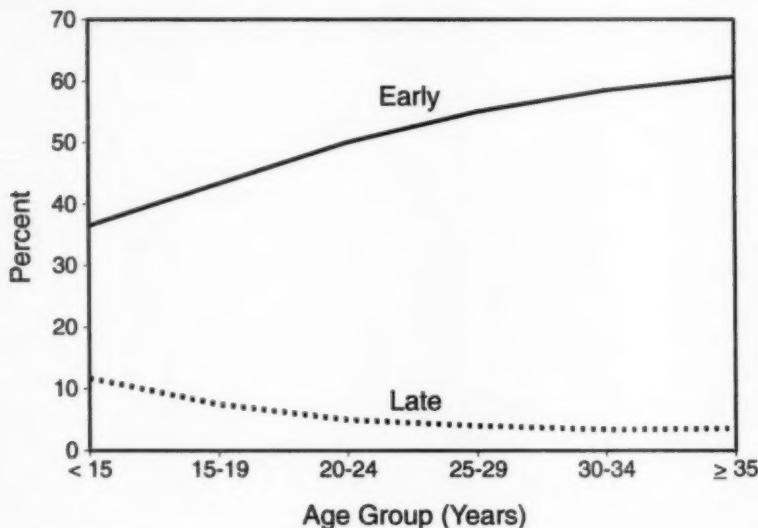
\*Per 1,000 live births.

**FIGURE 3. Abortion ratios,\* by age group<sup>†</sup> — United States, 1974–1990**

\*Per 1,000 live births.

<sup>†</sup>In years.

**FIGURE 4. Percentage of women having early\* and late† abortions, by age group — United States, 1990**



\*≤8 Weeks gestation.

†≥16 Weeks gestation.

as access to and education about safe, effective, and low-cost contraception and family planning services, may help minimize the need for abortion in the United States (20).

At present, not all states have recognized the need for state-based abortion surveillance, and some states that have recognized the need have been unable to gather information. In the near future, a greater emphasis will likely be placed on preventing unintended pregnancy, particularly among teenagers. To meet this need, the number and characteristics of women obtaining abortions will be needed from all states to furnish an accurate characterization of legal induced abortion in this country.

#### References

1. National Center for Health Statistics. Advance report of final natality statistics, 1990. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1993;41(suppl):9; DHHS publication no. (PHS)93-1120. (Monthly vital statistics report).
2. Koonin LM, Smith JC, Ramick M, Lawson HW. Abortion surveillance—United States, 1989. In: CDC surveillance summaries, September 1992. MMWR 1992;41(No. SS-5):1-33.
3. Koonin LM, Kochanek KD, Smith JC, Ramick M. Abortion surveillance: United States, 1988. In: CDC surveillance summaries, July 1991. MMWR 1990;40(No. SS-2):15-42.
4. Lawson HW, Atrash HK, Saftlas AF, Koonin LM, Ramick M, Smith JC. Abortion surveillance: United States, 1984-1985. In: CDC surveillance summaries, September 1989. MMWR 1989;38(No. SS-2):11-45.
5. Henshaw SK. Induced abortions: a world review, 1990. Fam Plann Perspect 1990;22:76-89.
6. Henshaw SK, Silverman J. The characteristics and prior contraceptive use of U.S. abortion patients. Fam Plann Perspect 1988;20:158-68.

7. Fielding WL, Sachtleben MR, Friedman LM, Friedman EA. Comparison of women seeking early and late abortion. *Am J Obstet Gynecol* 1978;131:304-10.
8. Tietze C, Henshaw SK. Induced abortion: a world review. 6th ed. New York: The Alan Guttmacher Institute, 1986.
9. CDC. Abortion surveillance 1974. Atlanta: US Department of Health, Education, and Welfare, Public Health Service, CDC, 1976:1-49.
10. Tietze C, Jain A. The mathematics of repeat abortion: explaining the increase. *Stud Fam Plann* 1978;9:294-9.
11. Tietze C, Bougaarts J. Repeat abortion in the United States: new insights. *Stud Fam Plann* 1982;13:373-9.
12. Cates W Jr, Schulz KF, Grimes DA, et al. Dilatation and evacuation procedures and second-trimester abortion: the role of physician skill and hospital setting. *JAMA* 1982;248:559-63.
13. Grimes DA. Second-trimester abortions in the United States. *Fam Plann Perspect* 1984;16:260-6.
14. Atrash HK, Lawson HW, Smith JC. Legal abortion in the US: trends and mortality. *Contemp Ob Gyn* 1990;35:58-69.
15. Henshaw SK, Forrest JD, VanVort J. Abortion services in the United States, 1987 and 1988. *Fam Plann Perspect* 1990;22:102-8.
16. Spitz AM, Ventura SJ, Koonin LM, et al. Surveillance for pregnancy and birth rates among teenagers, by state—United States, 1980 and 1990. In: CDC surveillance summaries, December 17, 1993. *MMWR* 1993(No. SS-6):1-27.
17. Jones EF, Forrest JD. Contraceptive failure rates based on the 1988 NSFG. *Fam Plann Perspect* 1992;24:12-19.
18. Torres A, Forrest JD. Why do women have abortions? *Fam Plann Perspect* 1988;20:169-76.
19. National Center for Health Statistics, Williams L, Pratt WF. Wanted and unwanted childbearing in the United States 1973-88. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1990;(189):1-7. (Advance data).
20. Westoff CF. Contraceptive paths towards the reduction of unintended pregnancy and abortion. *Fam Plann Perspect* 1988;20:4-13.



## Surveillance for Geographic and Secular Trends in Congenital Syphilis — United States, 1983–1991

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### Abstract

**Problem/Condition:** CDC monitors trends in the occurrence of congenital syphilis (CS) in the United States by using surveillance data sent from state and local health departments. Comparisons of data from this surveillance system with data from the Division of Sexually Transmitted Diseases/HIV Prevention and the Birth Defects Monitoring Program (BDMP) can be used to assess the potential effects of changes in case finding and reporting practices on these trends.

**Reporting Period Covered:** This report covers CS surveillance in the United States for the years 1983–1991.

**Description of System:** Cases of CS among infants <1 year of age and primary and secondary (P&S) syphilis among women are reported quarterly to CDC. The BDMP is a CDC national surveillance system that samples hospital discharge data on U.S. births.

**Results:** During the period 1983–1991, 12,151 CS cases were reported. Before 1988, regional CS incidence increased 35%–131% annually. Larger increases occurred in the Northeast (578%) in 1989 and in the South (178%), Midwest (244%), and West (777%) in 1990. Within regions, these larger increases were temporally related to increases in P&S syphilis in women and changes to a more sensitive CS case definition.

**Interpretation:** CS incidence has increased since 1983 in all regions of the United States. Increases since 1988 reflect both changes in surveillance reporting practices—the surveillance case definition for CS was changed in 1988 and further revised in 1989—and a true increase in incidence.

**Actions Taken:** These data indicate where CS prevention efforts need to be targeted. To facilitate reporting of CS cases, CDC has developed a) a shorter form for reporting cases of CS after 1991 and b) a software package for use by state and local health departments to enter and analyze CS data.

## INTRODUCTION

In 1992, more than 40 years since the introduction of penicillin, congenital syphilis (CS) should have been a disease of the past. The infection is largely preventable if pregnant women are tested for syphilis and, if found to be infected, treated with

penicillin early in pregnancy (1,2). Failure to prevent transmission of syphilis to the fetus often has devastating consequences: an estimated 40% of pregnancies among women who have untreated early syphilis will result in perinatal death (3). Despite the widespread availability of penicillin and serologic tests for syphilis, CS continues to be a public health problem. In 1991, more cases of CS among infants <1 year of age were reported than at any time since surveillance of CS in this age group began in 1951 (4).

The increase in the number of CS cases among infants <1 year of age probably represents a true increase in the incidence of CS in the United States. Primary and secondary (P&S) syphilis increased markedly after 1985; this increase was greater for women than men (5). Access to and use of prenatal care by women at high risk for syphilis may have decreased during the 1980s, thus reducing their chances of receiving adequate treatment during pregnancy (6). However, some of the increase in the number of CS cases since 1988 may be explained by changes in CS reporting practices: a more sensitive surveillance case definition for CS was developed in 1988 and further revised in 1989 (7,8). This new definition increased the number of cases considered reportable to CDC. In addition, several areas with high P&S syphilis rates initiated more active surveillance for CS in conjunction with or after the introduction of the surveillance case definition. This change also resulted in an increased number of cases identified and reported to CDC (CDC, unpublished data). Because these changes in CS case-finding and reporting practices did not occur uniformly in all reporting areas, trends in CS incidence can be difficult to interpret.

To examine trends in CS incidence and to assess the potential effects of the changes in CS case finding and reporting practices on these trends, we analyzed data for the number of CS cases reported to CDC from 1983 through 1991.

## METHODS

### Congenital Syphilis Case Definition

From 1983 through 1987, the Kaufman criteria served as the case definition for reporting CS to CDC. The Kaufman criteria are a combination of clinical and serologic findings that define and classify a case of CS on the basis of the likelihood of infection (9). These complex diagnostic criteria reflect the difficulty of clinical diagnosis and the inadequacy of currently available tests. Most infected infants do not manifest clinical signs at birth, and serologic tests for syphilis (STS) do not reliably indicate infection because of passive transfer of maternal antibody to the fetus.

The Kaufman criteria had limitations as a surveillance and reporting definition for public health use. They required laboratory tests that were not always performed at birth and follow-up STS that were difficult to obtain from infants whose mothers did not use health-care services (10). The sensitivity of the criteria was further diminished because stillbirths due to syphilis were not specifically mentioned in the criteria. Health departments differed in their interpretation of the criteria when they reported cases of CS, especially on the inclusion of infants who were stillborn or who had no signs of CS. For these reasons, the number of reported cases underrepresented the true burden of disease.

Recognizing these problems, CDC developed a surveillance case definition for CS in 1988, which was revised in 1989 (7,8). This case definition classifies as "presumptive" the infection of an infant whose mother had untreated or inadequately treated

syphilis at delivery, regardless of signs in the infant; or the infection of an infant or child who has a reactive treponemal test for syphilis and any one of the following:

- Any evidence of congenital syphilis on physical examination
- Any evidence of congenital syphilis on long-bone x-ray
- A reactive cerebrospinal fluid (CSF) venereal disease research laboratory (VDRL)
- An elevated CSF cell count or protein (without other cause)
- A reactive test for fluorescent treponemal antibody absorbed-19S-IgM antibody.

Cases are classified as "confirmed" (among infants) if they are laboratory confirmed. A syphilitic stillbirth is defined as a fetal death in which the mother had untreated or inadequately treated syphilis at delivery of a fetus of  $\geq 20$  weeks' gestation or of  $>500$  grams birth weight.

The relative simplicity and heightened sensitivity of this case definition (e.g., infants who were stillborn or who had no clinical signs are included) should allow more complete description of the burden of disease in the population.

From 1988 through 1991, health departments used either the Kaufman criteria or the CDC surveillance case definition. Surveys of health departments indicated that the surveillance case definition was not yet widely or uniformly adopted across the United States through 1990 (CDC, unpublished data). By the end of 1991, most but not all areas had adopted the surveillance case definition.

#### **CDC Sexually Transmitted Disease (STD) Surveillance Data: Summary Reports of CS and P&S Syphilis Among Women**

Reports of cases of CS and P&S syphilis were received by local and state health departments. For the period 1983–1991, summary data of cases of CS among infants  $<1$  year of age and cases of P&S syphilis among women were sent quarterly from state health departments to CDC. Data were available for 50 states and 63 large cities (most of which had populations  $>200,000$ ).

#### **Denominator Data**

Natality data from CDC's National Center for Health Statistics (NCHS) provided numbers of live births for the period 1983–1989; these data were used to compute national incidence (11,12). The incidence of CS among infants  $<1$  year of age was calculated as cases per 100,000 live births. The 1990 and 1991 provisional estimates for U.S. live births were used to calculate national CS incidence for those years (13). For the incidence of CS in regions, states, and large cities, we used natality data for the period 1983–1989; 1989 was used as an estimate for 1990 and 1991 births (12). The four geographic regions used in this report (Northeast, Midwest, South, and West) were defined by the U.S. Department of Commerce, Bureau of the Census (14).

Stillbirths were included in the numerator for incidence calculations for two reasons. First, because vital status was not collected in this data base, it was not possible to determine which cases occurred among stillborn infants. Second, on the basis of information from another data base of individual CS case reports, the number of stillbirths was small and unlikely to change incidence substantially. (Cases could not be linked between the two data bases because of incomplete reporting.)

## Birth Defects Monitoring Program Data

The Birth Defects Monitoring Program (BDMP) is a CDC national surveillance system that samples hospital discharge data on U.S. births (15). In 1983, the BDMP sampled approximately 800,000 births; more recently, 400,000–500,000 births have been sampled per year. Because hospitals participate in the BDMP voluntarily, the sample is neither random nor completely geographically representative. The percentages of live births sampled in each region are approximately 13% in the Northeast, 22% in the Midwest, 8% in the South, and 19% in the West.

We examined CS data from the BDMP for the period 1983–1991 as an independent measure of CS incidence for the United States. A case of CS was defined as occurring in an infant who received an *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) diagnostic code in the range 090.0–090.9.

## Other Data Sources

Data for surveillance practices and the case definition in use for the period 1983–1991 were ascertained directly from results of a telephone survey conducted by CDC in 1991 of state and local health department personnel. Passive surveillance was defined as identification of cases through reports of reactive STS in pregnant women or their infants to the health department from hospitals, laboratories, or health-care workers. Active surveillance was defined as identification of cases through regular reviews of hospital or laboratory records for reactive STS in pregnant women or their infants by health department personnel.

## Calculating the CS-to-P&S Ratio

We calculated the ratio of CS cases to cases of P&S syphilis among women (the CS-to-P&S ratio) to estimate the number of CS cases per 100 women with P&S syphilis. Cases of P&S syphilis in women in the year preceding CS cases were used to calculate the ratio because the changes in CS incidence lag behind P&S incidence by approximately 1 year (16). This ratio was calculated by assuming that the number of women reported with P&S syphilis was proportional to the size of the pregnant population with infectious syphilis during a given year. For this assumption to be valid, changes in the age and racial/ethnic distribution of women with P&S syphilis were assumed not to substantially alter the fertility rate of this population over the study period. Because no data exist on fertility rates of women with syphilis, these assumptions were tested by applying age- and racial/ethnic-specific fertility rates of U.S. women to the population of women with P&S syphilis. The estimated proportion of women with P&S syphilis who became pregnant was not found to change over time (CDC, unpublished data).

The CS-to-P&S ratio was used to compute the expected number of CS cases in the 2-year period during the implementation of the surveillance definition for different areas. A 2-year period was chosen because the implementation of the surveillance definition usually occurred in stages and affected >1 calendar year. For each area, the expected number of cases was calculated by multiplying the average CS-to-P&S ratio for the 5-year period before the change in case definition by the 2-year total of P&S syphilis cases in women. Cases of P&S syphilis in women were defined as including both the year before and the first year of implementation of the surveillance definition to allow for a year's delay between CS and P&S incidence. For example, the average CS-to-P&S ratio for the 5-year period before the change in case definition in New York

City was 10.8 cases per 100 women with P&S syphilis. Therefore, the expected number of CS cases during the 2-year implementation period (1988–1989) was 377 (10.8 multiplied by 3,488 [the number of women with P&S syphilis cases during 1987–1988] divided by 100).

The difference between the observed (reported) CS cases and the expected CS cases, expressed as a percentage of the observed cases, was a crude estimate of the effect of factors other than P&S syphilis among women on reported CS incidence for those years. This difference, when expressed as a percentage of the expected cases, showed how much observed cases exceeded the expected numbers.

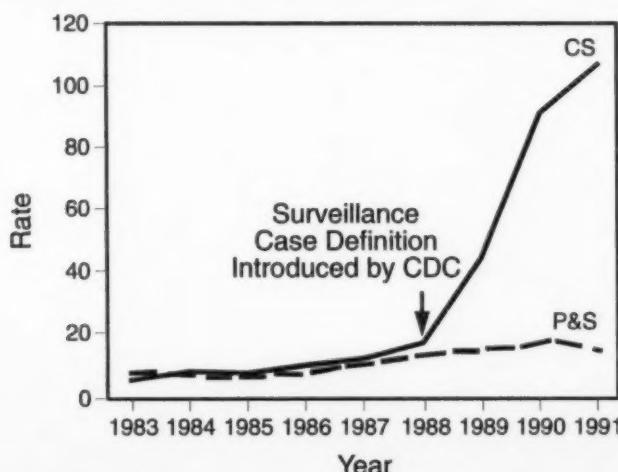
## RESULTS

### Summary CS Data

From 1983 through 1991, 12,151 CS cases in infants <1 year of age were reported in the United States. CS incidence increased from 4.3 cases per 100,000 live births (158 cases) in 1983 to 107.0 cases per 100,000 live births (4,398 cases) in 1991; the largest increase in cases occurred after 1988 (Figure 1).

From 1983 through 1988, before the introduction of the surveillance case definition, CS incidence in each region increased at an average annual rate ranging from 35% (Midwest) to 131% (Northeast) (Figure 2). From 1988 through 1989, CS incidence in the Northeast increased 578% (from 21.9 to 148.5 cases per 100,000 live births); the incidence in the West declined slightly (from 14.5 to 9.8 cases per 100,000 live births) (Table 1). From 1989 through 1990, CS incidence increased 178% in the South (from 33.8 to 93.9 cases per 100,000 live births), 777% in the West (from 9.8 to 86.0 cases per

**FIGURE 1. Rates of congenital syphilis (CS)\* and primary and secondary syphilis (P&S)<sup>†</sup> among women — United States, 1983–1991**

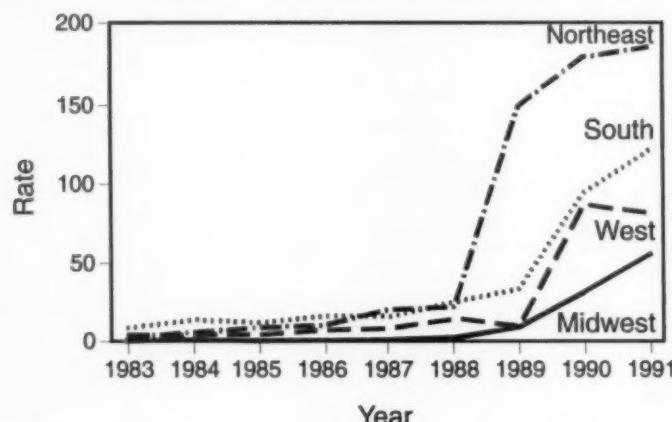


\*Cases per 100,000 live births.

<sup>†</sup>Cases per 100,000 female population.

100,000 live births), and 244% in the Midwest (from 9.3 to 32 cases per 100,000 live births). In 1991, the Northeast had the highest rate of CS (186.2 cases per 100,000 live births), followed by the South (120.9 cases per 100,000 live births), the West (80.6 cases per 100,000 live births), and the Midwest (54.8 cases per 100,000 live births) (Table 1).

**FIGURE 2.** Rates\* of congenital syphilis, by region — United States, 1983–1991



\*Cases per 100,000 live births.

**TABLE 1.** Incidence\* of congenital syphilis, by region and by cities and states with highest incidence — United States, 1987–1991

	1987	1988	1989	1990	1991
<b>Northeast</b>	<b>20.3</b>	<b>21.9</b>	<b>148.5</b>	<b>179.8</b>	<b>186.2</b>
New York City	98.5	104.4	765.6	756.6	736.2
Philadelphia	45.5	62.1	78.5	611.0	1,027.4
<b>Midwest</b>	<b>1.7</b>	<b>2.7</b>	<b>9.3</b>	<b>32.0</b>	<b>54.8</b>
Detroit	15.0	25.3	83.2	267.3	306.7
Chicago	14.5	24.8	94.4	278.0	420.4
<b>South</b>	<b>15.7</b>	<b>25.1</b>	<b>33.8</b>	<b>93.9</b>	<b>120.9</b>
Florida <sup>†</sup>	53.0	85.7	79.1	293.8	203.7
Georgia	6.8	5.7	12.7	76.2	126.1
Maryland	2.8	7.9	25.6	104.8	69.0
Miami	156.2	440.9	533.7	412.9	1,283.9
New Orleans	0.0	0.0	299.2	993.8	288.5
Texas	14.9	13.8	31.2	68.3	84.5
Washington, DC	19.6	47.4	84.8	246.0	2,086.7
<b>West</b>	<b>8.6</b>	<b>14.5</b>	<b>9.8</b>	<b>86.0</b>	<b>80.6</b>
California <sup>‡</sup>	6.5	10.3	9.4	51.6	45.4
Los Angeles	52.7	96.7	49.3	618.5	599.2

\*Number of cases per 100,000 live births.

<sup>†</sup>Excludes Miami.

<sup>‡</sup>Excludes Los Angeles.

CS incidence in the Northeast was primarily affected by two cities—New York City and Philadelphia. From 1988 through 1991, CS cases in New York City and Philadelphia accounted for 87% of cases in the Northeast and for 92% and 95% of cases in New York and Pennsylvania, respectively. During the same period, 87% of the increase in CS cases in the Northeast was attributable to increases in these two cities.

In contrast, a number of states and large cities contributed to CS incidence in the South. From 1989 through 1991, CS cases from some of the largest Southern cities (Miami, St. Petersburg, and Tampa, Florida; Atlanta, Georgia; New Orleans, Louisiana; Baltimore, Maryland; Dallas and Houston, Texas) contributed only 33% of cases in the South, which suggests that CS occurrence was also substantial in less highly urbanized areas. From 1989 through 1990, 81% of the increase in CS cases in the South was attributable to five states—Florida, Georgia, Louisiana, Maryland, and Texas. The increase in 1991 was attributed primarily to increases in two large urban areas (Washington, DC, and Miami, Florida) where large increases offset decreases in several other cities and states. In 1991, the incidence in Washington, DC, and Miami exceeded that in New York City and Philadelphia.

Cases of CS in California were the source of most of the increase in the West after 1989. In 1990, 65% of the increase in incidence was attributable to the increase in Los Angeles, where the incidence increased 1,155% (from 49.3 to 618.5 cases per 100,000 live births). In 1991, the incidence in the West decreased as a result of decreases in Los Angeles and the rest of California.

CS incidence in the Midwest, as in the Northeast, occurred primarily in two large urban areas—Chicago and Detroit. These two cities contributed 69% of cases in the Midwest from 1989 through 1991. In addition, they accounted for 71% of the increase in CS in 1990 and 43% of the increase in 1991. An additional 29% of the increase in 1991 was attributable to cases reported from Illinois and Michigan, excluding Chicago and Detroit.

### **Surveillance Practices**

From 1983 through 1991, most areas used passive surveillance to find CS cases. Some areas (i.e., Dallas, Houston, and Los Angeles) had established active surveillance practices before 1983 that did not change through 1991. Some areas initiated active surveillance during the period 1983–1991. These areas included Chicago in 1990; Detroit in 1991; Louisiana in 1989; Maryland, excluding Baltimore, in 1989; and New York City in 1988.

### **Comparison of Expected and Observed CS Cases**

For selected areas with high incidence, observed (reported) cases during the 2-year implementation period were higher than expected (mean percentage increase: 528%; range: 134%–1,300%) based on the CS-to-P&S ratio (Table 2). The mean percentage increase was greater among areas that adopted active surveillance during the implementation of the surveillance definition than among areas that continued passive surveillance (576% vs. 462%).

Overall, the average percentage difference between observed and expected cases was 77% (range: 57%–93%) (i.e., an average 77% of observed CS cases could not be explained by trends in P&S syphilis cases among women).

Before the change in case definition, the CS-to-P&S ratio differed widely among areas (range: 0.9–15.3). During the implementation of the surveillance definition, the

**TABLE 2. Expected and observed (reported) cases of congenital syphilis during the 2-year period of implementation of the surveillance case definition, by method of surveillance—selected areas with high incidence, United States, 1988–1991**

Surveillance method/ Area	Average CS-to-P&S ratio before implementation*	2-year implementation period	Cases			% increase† observed	% difference‡ observed	CS-to-P&S ratio during implementation**
			P&S syphilis	CS expected†	CS observed			
<b>Passive continuous</b>								
Florida††	5.3	1990–91	4,418	234	862	268	72.8	19.5
Georgia	0.9	1990–91	3,308	30	223	643	86.5	6.7
Miami	12.3	1990–91	840	103	337	227	69.4	40.1
Philadelphia	6.6	1990–91	1,876	124	480	287	74.2	26.6
Washington, DC	5.1	1991	483	25	246	884	89.8	50.9
<b>Active continuous</b>								
Los Angeles	4.4	1990–91	1,809	80	1,012	1,165	92.1	55.9
<b>Passive-active</b>								
Chicago	15.3	1990–91	922	141	407	189	65.4	44.1
Detroit	10.3	1990–91	502	52	131	152	60.3	26.1
New Orleans	0.9	1988–89	255	2	28	1,300	92.9	11.0
Maryland	1.4	1989–90	662	9	102	1,033	91.2	15.4
New York City	10.8	1988–89	3,488	377	1,150	205	67.2	33.0
<b>Mixed§</b>								
Texas	4.9	1990–91	2,017	99	472	377	79.0	23.4
	5.0	1990–91	4,014	201	470	134	57.2	11.7

\*The average ratio of CS cases to P&S syphilis cases among women during the 5-year period before the implementation of the surveillance case definition.

†The expected number of CS cases was calculated as [(average CS-to-P&S ratio before implementation) × (number of P&S syphilis cases among women reported)]/100.

‡The percentage increase was calculated as [(observed – expected) / expected] × 100. For Washington, DC, this increase was calculated by using observed cases for a 1-year period.

§The percentage difference was calculated as [(observed – expected) / observed] × 100. For Washington, DC, this difference was calculated by using observed cases for a 1-year period.

\*\*The average ratio of CS cases to P&S syphilis cases among women for the 2-year implementation period.

††Excludes Miami.

§§Surveillance practices differed among cities in both states.

¶¶Excludes Los Angeles.

CS=Congenital syphilis.  
P&S syphilis=Primary and secondary syphilis.

CS-to-P&S ratio increased in all areas; however, the increase was uneven (range: 134%–1,170%) and differences among areas persisted. Three of five areas that adopted active surveillance during the implementation of the surveillance definition (Chicago, Detroit, and New York City) had smaller changes in the CS-to-P&S ratio than did areas that maintained passive surveillance practices.

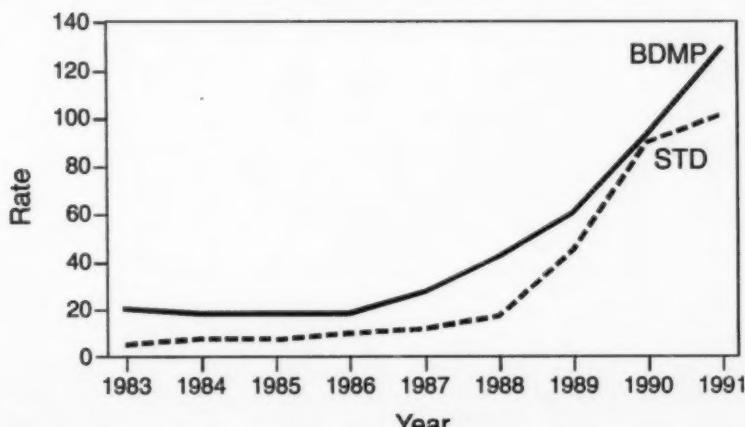
### BDMP Data

From 1983 through 1991, the BDMP detected a trend in CS similar to the trend seen in the STD surveillance system for CS (Figure 3). However, the CS incidence in the BDMP was consistently higher than its incidence in the STD surveillance system. Before 1989, the incidence in the BDMP was 100% to 300% higher than in the STD surveillance system. From 1989 through 1991, the incidence in the BDMP was only 2% to 34% higher. The BDMP surveillance system detected the first substantial increase (50%) in CS incidence 1 year before the STD surveillance system (1987 vs. 1988).

## DISCUSSION

The incidence of CS increased throughout the United States during the period 1983 through 1991, and the largest increases occurred after 1988. This trend was seen in each region, although the increases after 1988 differed in magnitude. The most dramatic increases in a single year occurred in the Northeast and the West, reflecting increases in cases reported from New York City and Los Angeles. Similarly, cases reported from major urban areas in the Midwest (Chicago and Detroit) and the South (Washington, DC, and Miami) contributed to large increases in those regions.

**FIGURE 3. Comparison of the rates\* of congenital syphilis reported to the Birth Defects Monitoring Program (BDMP) and the national sexually transmitted diseases (STD) surveillance system — United States, 1983–1991**



\*Cases per 100,000 live births.

The beginning of the increase in CS in each region was closely related to increases in P&S syphilis among women (17). Except in the Midwest, the increase in CS in each region was proportionately larger than the increases in P&S syphilis among women. The increases in CS continued after the incidence of P&S syphilis among women had reached a plateau or declined by 1991. In the Midwest, the CS and P&S syphilis trends were similar and still increasing through 1991.

The timing of the large increases in CS in different areas often coincided with the adoption of the more sensitive CS surveillance case definition. After the surveillance definition was introduced, the proportion of observed cases in excess of those expected (percentage difference) ranged from 60% to 80% for most areas with high incidence. The weighted average of the percentage difference for these areas (75%) could be considered an estimate of the proportion of cases in the United States from 1989 through 1991 that were attributable to the changes in the CS case definition. This estimate should be interpreted only to represent the maximum potential effect of the change in case definition, because other changes in surveillance and reporting during this period could also have contributed to the additional cases observed.

The lack of sensitivity of the Kaufman criteria was an important factor in the magnitude of the increase in CS cases after the surveillance case definition was implemented. The experiences in Florida and Chicago were probably typical of the areas that already included infants without signs of CS and stillbirths in their case definition. Other areas, such as Los Angeles County, which previously included only infants with clinically apparent CS, were likely to report greater increases under the surveillance case definition. These three areas had also estimated the increase in cases by examining their records to determine how many infants would have been reported as having CS cases under the surveillance definition before it was implemented. In Florida, 25% more cases would have been reported (R.S. Hopkins, personal communication); in Chicago, 50% more cases would have been reported (L. Galaska, personal communication). In Los Angeles County, 295% more cases would have been reported if only the infants already known to the health department were included in the analysis (18). Similar to our findings, the estimated increases were lower for Florida and Chicago than for Los Angeles.

The difference between our estimates of the increase in cases following implementation of the surveillance definition and the estimates of local and state health departments may be explained by several factors. The evaluations done by the health departments compared cases for a single year and were not affected by other surveillance and reporting changes. In our analysis, two periods of time were compared. Between the comparison periods, surveillance and reporting may have improved or the risk of having an infant with CS among women with syphilis may have increased. Other important surveillance factors that could have influenced the changes in CS incidence include syphilis screening policies in states and municipalities, testing policies in hospitals, reporting practices in hospitals, and the number of health-department personnel available to monitor reporting practices and investigate possible CS cases.

In addition, the change from passive to active surveillance could have contributed substantially to the reported increases in the number of cases. In areas where syphilis testing was mandatory at delivery and where health departments conducted active surveillance of laboratory and hospital records, a higher proportion of infants infected with CS would have been identified than in areas where these practices were not in

place. After areas were stratified by the surveillance method used during the implementation period, the average percentage increase was greater for areas that changed to active surveillance; this finding indicates that changing to active surveillance increased the number of reported cases in addition to the change in the case definition. Because these changes occurred simultaneously, the proportion of the increase contributed by each of these changes is difficult to measure.

Although changes in surveillance and reporting practices affected CS trends, several factors suggest a true increase in CS incidence has occurred. First, increases were occurring in most areas before the surveillance case definition was implemented. Second, the number of cases during the implementation of the surveillance definition was also predicted to be higher on the basis of increases in the number of cases of P&S syphilis among women. Third, in large cities that had not changed case definition or surveillance practices through 1991 (e.g., Baltimore and Dallas), increases in CS incidence were still noted. Finally, an increase in CS after 1986 was also demonstrated by an independent surveillance system, the BDMP. The higher CS incidence in the BDMP data indicates that, before 1989, the CS surveillance system may not have been adequately describing the burden of disease. After 1988, the decrease in the difference in incidence reported by the two systems (2% vs. 34%) indicates that the sensitivity of the CS surveillance system had improved.

Alternatively, selection and reporting biases in the BDMP may account for the higher incidence observed by use of this surveillance system. First, the BDMP may have oversampled hospitals in areas with high syphilis morbidity, mandatory syphilis testing practices, or better detection methods for CS. To determine if CS cases from cities with high syphilis morbidity contributed more to incidence in the BDMP system compared with the STD system, BDMP and STD data were reanalyzed after data were excluded for cases from six large cities (Chicago, Detroit, Los Angeles, Miami, New York City, and Philadelphia). We found that CS incidence in both systems decreased; however, incidence in the BDMP system remained higher than in the STD system for all years except 1990 and 1991. After 1987, these six large cities accounted for 52% of the CS incidence each year in both the STD and BDMP surveillance systems. These findings indicate that the selection of hospitals in six cities with high syphilis morbidity did not account for the difference between the two systems.

An important reporting bias in the BDMP was the lack of a case definition for CS. The BDMP system used ICD-9-CM diagnostic codes, which did not specify the criteria for the diagnosis of CS. Thus, infants may have been included who would not have met the CDC criteria for CS. For example, in some hospitals, all infants who had reactive STS at birth may have been diagnosed and treated as having CS, regardless of maternal history. Similarly, changes to more sensitive detection methods among selected hospitals could have caused some of the increase in incidence in the BDMP system after 1986.

## RECOMMENDATIONS

To improve the detection and reporting of CS, health departments should a) ensure that all personnel responsible for CS case investigation and reporting understand and consistently use the surveillance case definition; b) ensure that hospitals with obstetrical services in areas with high syphilis incidence test all women for syphilis at the time of delivery and that test results be available before the mother and infant are

discharged from the hospital; and c) teach the medical community how to evaluate and treat infants suspected of having CS and how to report these cases to the health department.

Health departments also should regularly evaluate surveillance data to ensure that all cases of CS are being identified. The CS-to-P&S ratio may be useful as a measure of effective case finding. Although no single ratio should be attained by all areas, areas with high syphilis morbidity that identify substantially fewer CS cases per 100 women with P&S syphilis than do other high morbidity areas should evaluate the effectiveness of their case finding. This evaluation should include a review of hospital or laboratory records for additional cases of CS and a review of the adequacy of current syphilis testing policies for pregnant women. A low CS-to-P&S ratio should not be assumed to demonstrate successful prevention of CS. Prevention effectiveness can be evaluated only after CS case-finding activities appropriate to the level of syphilis morbidity in the area have been well established. A high ratio should prompt a re-evaluation of prevention efforts.

#### References

1. Ingraham NR, Beerman H. The present status of penicillin in the treatment of syphilis in pregnancy and infantile congenital syphilis. *Am J Med Sci* 1950;219:433-42.
2. Platou RV. Treatment of congenital syphilis with penicillin. *Adv Pediatr* 1949;4:39-86.
3. Ingraham NR. The value of penicillin alone in the prevention and treatment of congenital syphilis. *Acta Derm Venereol* 1951;31(suppl 24):60-88.
4. Venereal Disease Program, Public Health Service. VD fact sheet. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, December 1954:16; PHS publication no. 341.
5. Roiffs RT, Nakashima AK. Epidemiology of primary and secondary syphilis in the United States, 1981 through 1989. *JAMA* 1990;264:1432-7.
6. Brown SS, ed. *Prenatal care: reaching mothers, reaching infants*. Washington, DC: National Academy Press;1988:45-51.
7. CDC. Guidelines for the prevention and control of congenital syphilis. *MMWR* 1988;37 (suppl 1):1-13.
8. CDC. Congenital syphilis—New York City, 1986-1988. *MMWR* 1989;38:825-9.
9. Kaufman RE, Jones OG, Blount JH, Wiesner PJ. Questionnaire survey of reported early congenital syphilis: problems in diagnosis, prevention, and treatment. *Sex Transm Dis* 1977;4:135-9.
10. Zenker PN, Berman SM. Congenital syphilis: reporting and reality. *Am J Public Health* 1990;80:271-2.
11. National Center for Health Statistics. 1983 to 1988 Natality detail [Public use data tape documentation]. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1983-1988.
12. National Center for Health Statistics. Advance report of final natality statistics, 1989. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1991;40:38-40. (Monthly vital statistics report).
13. National Center for Health Statistics. Births, marriages, divorces, and deaths for 1991. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1992;40:1. (Monthly vital statistics report).
14. Bureau of the Census. Geographic identification code scheme; 1980 Census of Population and Housing: 3,10; PHC80-R5. Washington, DC: US Department of Commerce, Bureau of the Census, April 1983.
15. Edmonds LD, Layde PM, James LM, Flynt JW, Erickson JD, Oakley GP. Congenital malformations surveillance: two American systems. *Int J Epidemiol* 1981;10:247-52.
16. Schulz KF, Murphy FK, Patamasucon P, Meheus AZ. Congenital syphilis. In: Holmes KK, Mardh PA, Sparling PF, Wiesner PJ. *Sexually transmitted diseases*. 2nd ed. New York, NY: McGraw-Hill;1990:822.

17. Webster LA, Rolfs RT, Nakashima AK, Greenspan JR. Regional and temporal trends in the surveillance of syphilis, United States, 1986-1990. In: CDC surveillance summaries, December 1991. MMWR 1991;40(No. SS-3):29-33.
18. Cohen D, Boyd D, Prabhusas I, Mascola L. The effects of case definition, maternal screening, and reporting criteria on rates of congenital syphilis. Am J Public Health 1990;80:316-7.



## Surveillance for Ectopic Pregnancy — United States, 1970–1989

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### Abstract

**Problem/Condition:** From 1970 through 1989, hospitalizations for ectopic pregnancy have increased in the United States; the number of cases has increased fivefold, from 17,800 to 88,400.

**Reporting Period Covered:** 1970–1989.

**Description of System:** Reported ectopic pregnancies were estimated from data collected by CDC's National Center for Health Statistics (NCHS) as part of the ongoing National Hospital Discharge Survey. Data from responding hospitals were weighted to represent national estimates. The number of deaths resulting from ectopic pregnancy was based on U.S. vital statistics collected by NCHS. Denominators for calculating ectopic pregnancy rates were the total number of reported pregnancies, which includes live births, legal induced abortions, and ectopic pregnancies. Data for live births were obtained from NCHS natality statistics and data for legal induced abortions from CDC's Division of Reproductive Health.

**Results:** From 1970 through 1989, more than one million ectopic pregnancies were estimated to have occurred among women in the United States; the rate increased by almost fourfold, from 4.5 to 16.0 ectopic pregnancies per 1,000 reported pregnancies. Although ectopic pregnancies accounted for <2% of all reported pregnancies during this period, complications of this condition were associated with approximately 13% of all pregnancy-related deaths. During this period, the risk of death associated with ectopic pregnancy decreased by 90%: the case-fatality rate declined from 35.5 deaths per 10,000 ectopic pregnancies in 1970 to 3.8 in 1989. The risks of ectopic pregnancy and death from its complications were consistently higher for blacks and other racial/ethnic minorities than for whites throughout the period.

**Interpretation:** Although the general trend has been for the numbers and rates of ectopic pregnancy to increase over the 20-year period, the variability of the data does not permit meaningful conclusions to be made about year-to-year changes in the estimates of ectopic pregnancies, especially for the years 1988 and 1989.

**Actions Taken:** These findings indicate the need to characterize behaviors and risk factors that may respond to preventive interventions. Until these risks factors are better characterized, early detection and appropriate management of ectopic pregnancies will remain the most effective means of reducing the morbidity and mortality associated with this condition.

## INTRODUCTION

From 1970 through 1989, the estimated numbers and rates of hospitalizations for ectopic pregnancy have increased in the United States. This complication of early pregnancy, which results when fertilized ova implant at sites other than the endometrial lining of the uterus, results in not only fetal loss, but also the potential for considerable maternal morbidity and the risk of maternal death (1,2). Although ectopic pregnancies accounted for only 1.6% of all reported pregnancies during 1989, complications of the condition were among the leading causes of maternal death in the United States and the leading cause of maternal death during the first trimester (2-4).

CDC has previously reported data for ectopic pregnancy during the period 1970-1987 (5). This surveillance summary updates previous reports and includes data for 1988 and 1989 (6).

## METHODS

The numbers of reported ectopic pregnancies were estimated from data collected by CDC's National Center for Health Statistics (NCHS) as part of the ongoing National Hospital Discharge Survey (NHDS).

Before 1988, the NHDS, which is conducted annually, sampled approximately 400 nonfederal, short-stay hospitals representing all 50 states and the District of Columbia. Demographic data, diagnoses, and surgical procedures were abstracted from a sample of medical records from responding hospitals and weighted to represent national estimates (7).

In 1988, NCHS redesigned the NHDS to establish geographic consistency with other NCHS surveys and to improve its efficiency through the use of improved information and technologies (8). The universe of the survey was changed to include all hospitals that provide general medical, surgical, and pediatric care, regardless of length of stay; however, 98% of the hospitals were short-term. The sampling methodology was also changed to include all hospitals with  $\geq 1,000$  beds or  $\geq 40,000$  annual discharges; the remaining sample of hospitals is based on a stratified three-stage design. In 1988 and 1989, data were collected from about 470 participating hospitals, with approximately 250,000 discharges yearly (9).

The diagnosis of ectopic pregnancy for the years 1970-1978 was based on hospital discharge records with a diagnosis code of 631, according to the *International Classification of Diseases, Eighth Revision, Adapted for Use in the United States* (10). For 1979-1989, ectopic pregnancies were coded as 633, according to the *International Classification of Diseases, Ninth Revision, Clinical Modification* (11).

The number of deaths resulting from ectopic pregnancy was based on U.S. vital statistics collected by NCHS. Ectopic pregnancy rates were calculated by dividing the estimated number of ectopic pregnancies by the total number of reported pregnancies. The term "reported pregnancies" was defined as the sum of live births, legal induced abortions, and ectopic pregnancies. Data for live births were obtained from NCHS natality statistics (12) and data for legal induced abortions from CDC's Division of Reproductive Health. Ectopic pregnancy rates were reported as ectopic pregnancies per 1,000 reported pregnancies. Case-fatality rates, which were calculated by dividing the number of deaths resulting from complications of ectopic pregnancy by the

estimated number of ectopic pregnancies, were reported as deaths per 10,000 ectopic pregnancies.

The four geographic regions used in this report (Northeast, Midwest, South, and West) were those defined by the U.S. Department of Commerce, Bureau of the Census (13).

To calculate ectopic pregnancy rates, women were grouped into three age categories: 15-24, 25-34, and 35-44 years. To analyze deaths resulting from complications of ectopic pregnancy, women were grouped into six age categories: 15-19, 20-24, 25-29, 30-34, 35-39, and 40-44 years.

Race-specific rates for the categories "white" and "black and other" were used. When information on race was not included in the NHDS data base, we redistributed the ectopic pregnancies according to the distribution of cases for which race was known. Phenotypic racial markers were not related to genetic susceptibility for the underlying causes of ectopic pregnancy. However, such markers have been used as surrogates for a variety of potential risk factors (biologic, social, cultural, or environmental) that are linked to ectopic pregnancy.

To assess time trends, we grouped estimates of ectopic pregnancies and deaths resulting from this condition into four 5-year periods: 1970-1974, 1975-1979, 1980-1984, and 1985-1989.

Reported estimates of ectopic pregnancies were rounded to the nearest hundred. Rounding and redistribution of cases with unknown race sometimes caused the sum of the numbers to differ from the total. However, rates were calculated from the unrounded estimates.

We calculated 95% confidence intervals around point estimates for the years 1970 through 1987, using standard error curves described by NCHS (8). For 1988 and 1989, we calculated standard errors with SUDAAN software (14), using a first-order Taylor approximation of the deviation of estimates from their expected values (8). We also calculated confidence intervals for estimated case-fatality rates according to those standard errors (15).

## RESULTS

In 1988, the number and rate of ectopic pregnancies decreased from those reported in 1987 (Table 1 and Figure 1) (5); however, the change was not statistically significant. Among the estimated 80,700 ectopic pregnancies, the highest rate occurred among women ages 35-44 years (27.2/1,000 reported pregnancies). When the data were analyzed by race, the rate of ectopic pregnancies decreased 13% for whites, from 15.4 per 1,000 reported pregnancies in 1987 to 13.4 in 1988, but the rate decreased only 1% for blacks and other minorities, from 21.0 per 1,000 in 1987 to 20.8 in 1988. In 1988, the risk of ectopic pregnancy among blacks and other minorities was 1.6 times the risk among whites, a 14% increase since 1987 (5).

In 1989, the number and rate of ectopic pregnancies increased to about the 1987 estimates, although the change was not statistically significant (Table 1 and Figure 1) (5). As in previous years, women ages 35-44 years had the highest rates of ectopic pregnancy (24.9/1,000 reported pregnancies) (6). Ectopic pregnancy rates for blacks and other minorities again decreased, from 20.8 per 1,000 reported pregnancies in 1988 to 17.3 in 1989, while the rate for whites increased from 13.4 in 1988 to 15.6 in 1989—a figure comparable with that reported in 1987 (Figure 2). The risk of ectopic

**TABLE 1. Numbers and rates of ectopic pregnancies, by year — United States, 1970–1989**

Year	Number*	95% CI†	Rate‡
1970	17,800	(11,200– 24,400)	4.5
1971	19,300	(12,300– 26,300)	4.8
1972	24,500	(16,800– 32,200)	6.3
1973	25,600	(17,600– 33,600)	6.8
1974	26,400	(18,600– 34,200)	6.7
1975	30,500	(22,400– 38,600)	7.6
1976	34,600	(26,600– 42,600)	8.3
1977	40,700	(29,900– 51,500)	9.2
1978	42,400	(33,600– 51,200)	9.4
1979	49,900	(40,100– 59,700)	10.4
1980	52,200	(42,000– 62,400)	10.5
1981	68,000	(55,800– 80,300)	13.6
1982	61,800	(51,900– 71,800)	12.3
1983	69,600	(60,000– 79,300)	14.0
1984	75,400	(66,500– 84,300)	14.9
1985	78,400	(69,200– 87,600)	15.2
1986	73,700	(65,000– 82,400)	14.3
1987	88,000	(78,000– 98,000)	16.8
1988	80,700	(67,200– 94,200)	15.1
1989	88,400	(70,600– 106,100)	16.0
Total	1,047,900†		11.3

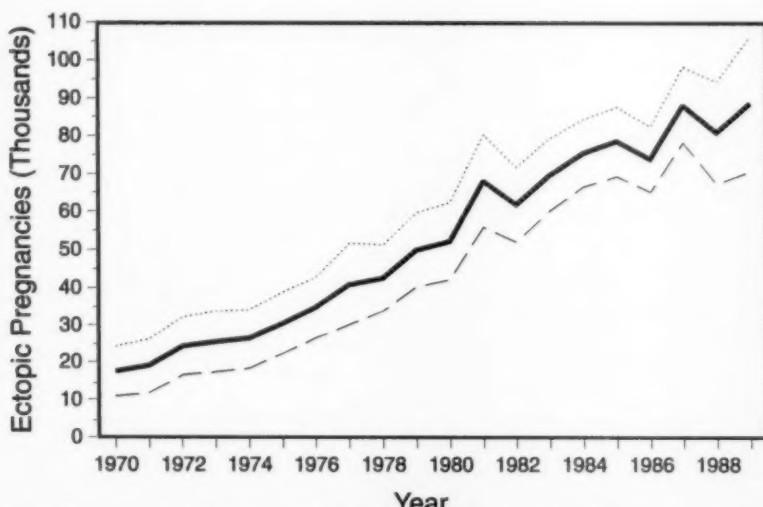
\*Rounded to the nearest hundred.

†Confidence interval.

‡Rate per 1,000 reported pregnancies (live births, legal abortions, and ectopic pregnancies).

†Because of rounding, the total may differ from the sum of the numbers.

**FIGURE 1. Estimation\* of the number of ectopic pregnancies — United States, 1970–1989**



\*Dashed lines represent the upper and lower limits of 95% confidence intervals.

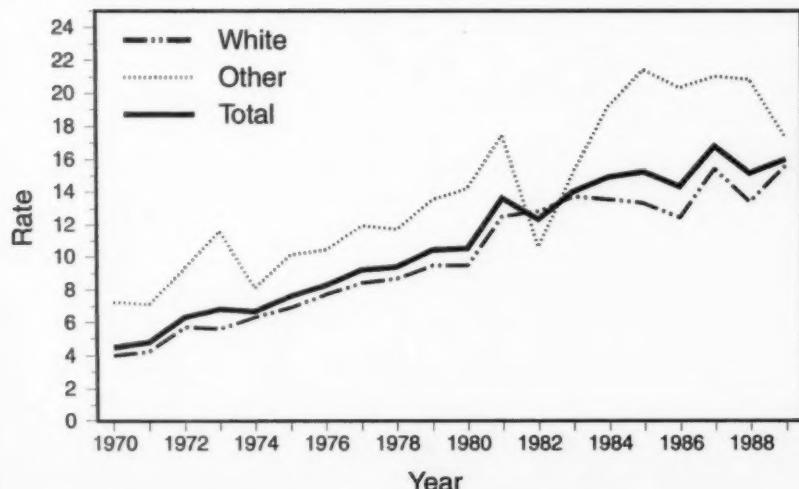
pregnancy for blacks and other minorities was 1.1 times the risk for whites in 1989—a decrease from that reported in 1988.

From 1970 through 1989, approximately 1,047,900 ectopic pregnancies were reported among women ages 15–44 years in the United States. The overall rate was 11.3 per 1,000 reported pregnancies (Table 1). Over the 20-year period, the estimated number of ectopic pregnancies increased fivefold, from 17,800 in 1970 to 88,400 in 1989. For all women combined, ectopic pregnancy rates increased almost fourfold, from 4.5 per 1,000 reported pregnancies in 1970 to 16.0 in 1989. The rates increased almost fourfold (from 4.0 in 1970 to 15.6 in 1989) for whites and more than doubled (from 7.2 in 1970 to 17.3 in 1989) for blacks and other minorities (Figure 2).

The risk of ectopic pregnancy increased with age for both racial groups and was highest for women 35–44 years old (Table 2). Whites ages 35–44 were 3.1 times more likely than those ages 15–24 to have an ectopic pregnancy (rates: 19.0 vs. 6.1). Blacks and other minorities ages 35–44 were 3.7 times more likely to have an ectopic pregnancy than their counterparts ages 15–24 (rates: 30.1 vs. 8.2). Rates of ectopic pregnancy were higher for blacks and other minorities than for whites in all age groups.

Overall, for the period 1970–1989, the rates of ectopic pregnancy for the four geographic regions were similar. The highest rates occurred in the South (Table 3). However, region-specific rates varied by race. For whites, the rate was highest in the West; for blacks and other minorities, the rate was highest in the Midwest. In all four regions, the rates for blacks and other minorities were higher than those for whites (Table 3).

**FIGURE 2. Rates\* of ectopic pregnancy, by race —United States, 1970–1989**



\*Per 1,000 reported pregnancies (live births, legal abortions, and ectopic pregnancies).

When numbers of ectopic pregnancies were combined into four 5-year periods (1970–1974, 1975–1979, 1980–1984, and 1985–1989) and analyzed by race, the rate for whites increased 2.7-fold and the rate for blacks and other minorities increased 2.3-fold from the first to the fourth period (Figure 3).

In 1988, 44 deaths (15% of all maternal deaths) resulted from complications of ectopic pregnancy (16). The case-fatality rate was 5.5 per 10,000 ectopic pregnancies—a 62% increase from the figure of 3.4 reported in 1987 (Table 4). In 1989, the number of deaths reported was 34 (13% of all maternal deaths) (17), and the case-fatality rate of 3.8 approximated that reported in 1987 (5). The risk of death associated with ectopic pregnancy complications was higher for blacks and other minorities than for whites in 1988 and 1989. The racial disparity during these 2 years increased from figures reported in 1986 and 1987 and was similar to figures reported from 1983 through 1985 (4), when fourfold higher rates were reported among blacks and other minorities (Table 4 and Figure 4).

**TABLE 2. Numbers and rates of ectopic pregnancies, by race\* and age group — United States, 1970–1989**

Race	Age group (yrs)	Number†	Rate§
White	15–44	742,400	10.3
	15–24	218,200	6.1
	25–34	443,100	13.7
	35–44	83,200	19.0
Black & other	15–44	304,100	14.7
	15–24	98,300	8.2
	25–34	167,700	22.6
	35–44	37,900	30.1
All races	15–44	1,046,500	11.3
	15–24	316,500	6.6
	25–34	610,800	15.4
	35–44	121,100	21.5

\*Race "unknown" redistributed according to the percentage of race known. Redistribution and rounding sometimes cause the sum of individual cells to differ from the total.

†Rounded to the nearest hundred.

§Per 1,000 reported pregnancies (live births, legal abortions, and ectopic pregnancies).

**TABLE 3. Numbers and rates of ectopic pregnancies, by race\* and geographic region — United States, 1970–1989**

Race	Region	Number†	Rate§
White	Northeast	141,100	9.3
	Midwest	187,300	10.1
	South	221,100	10.2
	West	195,900	11.3
Black & other	Northeast	65,100	14.1
	Midwest	61,000	16.8
	South	137,600	15.9
	West	38,100	11.6
All races	Northeast	206,200	10.4
	Midwest	248,800	11.1
	South	358,700	11.9
	West	234,000	11.3

\*Race "unknown" redistributed according to the percentage of race known. Redistribution and rounding sometimes cause the sum of individual cells to differ from the total.

†Rounded to the nearest hundred.

§Per 1,000 reported pregnancies (live births, legal abortions, and ectopic pregnancies).

During the period 1970-1989, 860 women died from complications of ectopic pregnancy. Although small increases in numbers of deaths and case-fatality rates occurred during 1988 and 1989, overall, the risk of death associated with ectopic pregnancy decreased during the 20-year period. During this interval, the case-fatality rate decreased by 90%, from 35.5 to 3.8 deaths per 10,000 ectopic pregnancies (Figure 5).

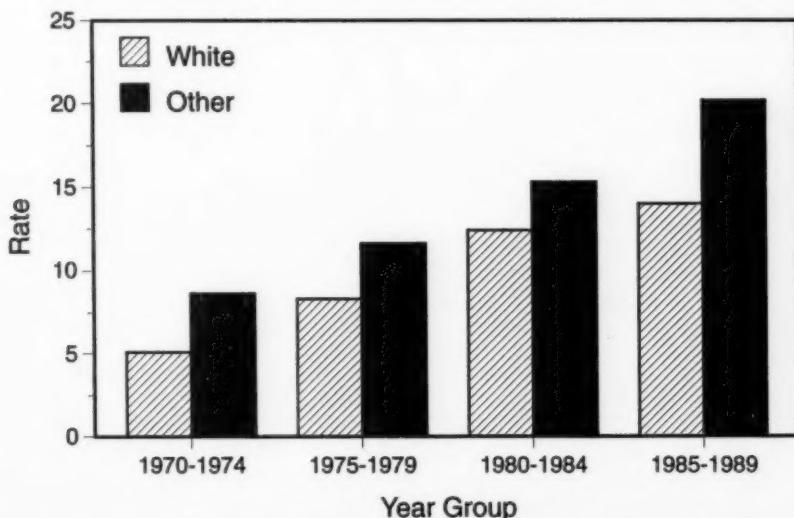
During the period 1970-1989, teenagers in both race groups had the highest mortality rates. However, the rate for black and other minority teenagers was almost five times that for white teenagers (Figure 6). In other age groups, case-fatality rates for blacks and other races were at least 2.5 times higher than the rates for whites.

Overall, for the 20-year period, the risk of death due to ectopic pregnancy was 3.4 times higher for blacks and other minorities than for whites. In addition, when the data were analyzed by time periods (1970-1974, 1975-1979, 1980-1984, and 1985-1989), case-fatality rates were consistently higher for blacks and other minorities than for whites (Figure 7). The racial gap increased 47% from the first period (1970-1974) to the second (1975-1979) and then decreased 27% from the second period to the third (1980-1984) and 6% from the third period to the fourth (1985-1989).

## DISCUSSION

With few exceptions, during the period 1970-1989 the numbers and rates of women hospitalized with ectopic pregnancies increased steadily; these increases affected all race groups. Possible reasons for the reported increases include a) a higher

**FIGURE 3. Rates\* of ectopic pregnancy, by race and year-group -- United States, 1970-1989**



\*Per 1,000 reported pregnancies (live births, legal abortions, and ectopic pregnancies).

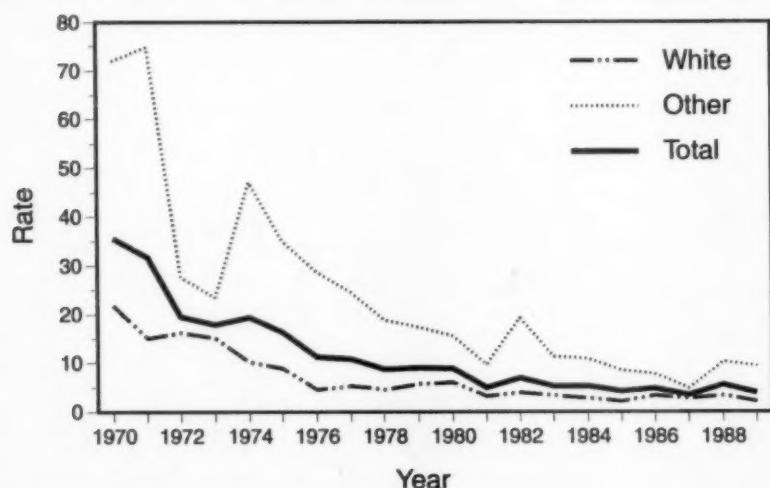
**TABLE 4. Numbers of deaths due to ectopic pregnancy and case-fatality rates, by race and year — United States, 1970–1989**

Year	Number			Rate*			
	White	Black/other	Total	White	Black/other	Total	(95% CI <sup>†</sup> )
1970	28	35	63	21.7	72.1	35.5	(22.2–48.8)
1971	21	40	61	15.1	74.9	31.7	(20.2–43.2)
1972	28	20	48	16.2	27.7	19.6	(13.5–25.8)
1973	25	21	46	15.1	23.4	18.0	(12.3–23.7)
1974	20	31	51	10.1	47.0	19.4	(13.7–25.1)
1975	19	31	50	8.8	34.9	16.4	(12.1–20.7)
1976	11	28	39	4.4	28.7	11.3	(8.7–13.9)
1977	15	29	44	5.2	24.5	10.8	(7.9–13.7)
1978	13	24	37	4.4	18.7	8.7	(6.9–10.6)
1979	20	25	45	5.7	17.2	9.0	(7.3–10.8)
1980	22	24	46	6.0	15.4	8.8	(7.1–10.6)
1981	15	19	34	3.1	9.7	5.0	(4.1–5.9)
1982	19	24	43	3.8	19.3	7.0	(5.8–8.1)
1983	17	20	37	3.3	11.2	5.3	(4.6–6.1)
1984	14	25	39	2.7	10.8	5.2	(4.6–5.8)
1985	11	22	33	2.1	8.4	4.2	(3.7–4.7)
1986	17	19	36	3.3	7.6	4.9	(4.3–5.5)
1987	17	13	30	2.6	4.8	3.4	(3.0–3.8)
1988	18	26	44	3.3	10.2	5.5	(4.5–6.4)
1989	14	20	34	2.1	9.2	3.8	(3.1–4.6)
Total	364	496	860	4.9	16.3	8.2	

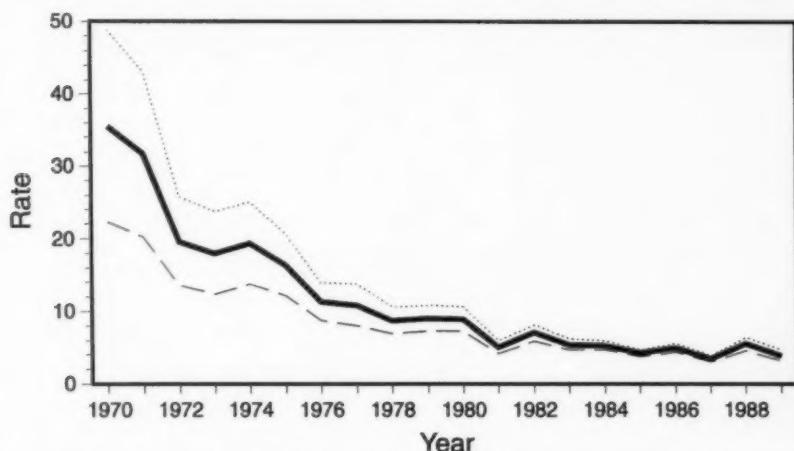
\*Deaths from ectopic pregnancy per 10,000 ectopic pregnancies.

<sup>†</sup>Confidence intervals for total rates.

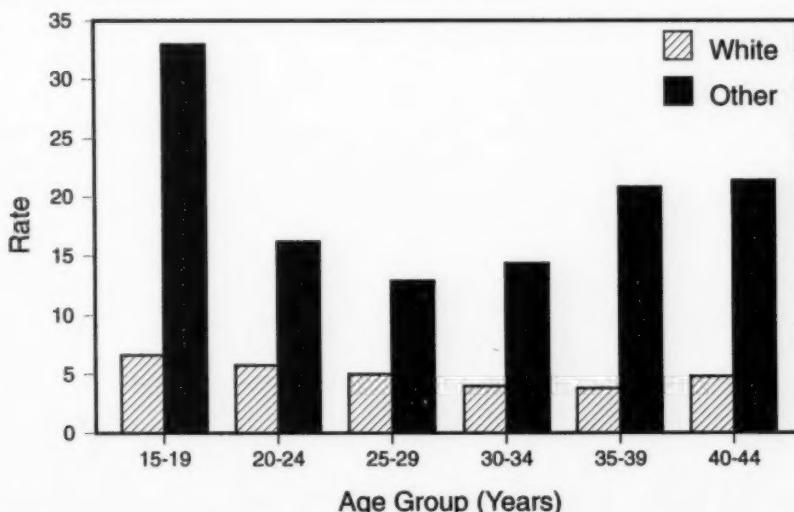
**FIGURE 4. Rates\* of ectopic pregnancy mortality, by race — United States, 1970–1989**



\*Per 10,000 ectopic pregnancies.

**FIGURE 5. Rates\* of ectopic pregnancy mortality — United States, 1970–1989**

\*Per 10,000 ectopic pregnancies. Dashed lines represent the upper and lower limits of 95% confidence intervals.

**FIGURE 6. Case-fatality rates\* for ectopic pregnancy, by race and age group — United States, 1970–1989**

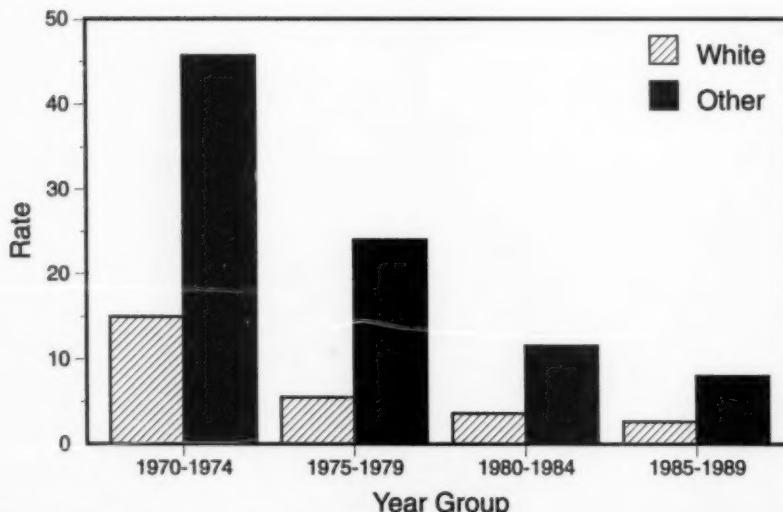
\*Per 10,000 ectopic pregnancies.

prevalence of risk factors for ectopic pregnancy or a lower prevalence of protective factors or both, b) a heightened awareness of ectopic pregnancy among health-care providers and patients, c) earlier diagnosis stemming from technologic advances, and d) a tendency for ectopic pregnancy to recur among women who have had one or more previous episodes (18-24).

Although the etiology of ectopic pregnancy is not well understood, the condition has been attributed to both maternal and embryonic factors. Maternal factors include alterations in tubal motility, variations in hormonal release, and anatomic changes such as scarring due to pelvic inflammatory disease (PID) (22,25). PID is usually mediated through sexually transmitted diseases, which may themselves be risk factors for ectopic pregnancy (26-29). Several recent studies have reported a higher risk of ectopic pregnancy among women who smoke (30-32). The possible mechanisms include a) altered tubal motility mediated through nicotine exposure that may increase opportunity for tubal implantation and b) reduced humoral and cellular immunity that may affect tubal epithelial response to inflammation and increase the risk of tubal inflammation.

Our data have several limitations. Although estimates of ectopic pregnancies have increased over time, some cases may not have been counted. Some ectopic pregnancies resolve spontaneously and therefore remain undiagnosed (33). Some cases were missed because the NHDS does not fully include ambulatory medical and surgical treatment of ectopic pregnancies in its survey design (19). However, the reported rates of ectopic pregnancies may well be overestimated because data for spontaneous abortions and stillbirths were excluded from the denominator. Another factor that

**FIGURE 7. Case-fatality rates\* for ectopic pregnancy, by race and year group — United States, 1970-1989**



\*Per 10,000 ectopic pregnancies.

may inflate the rates is that the numbers of induced abortions reported by CDC were consistently lower than numbers reported by a private source that based its estimates on direct surveys of legal abortion providers (34). Although the general trend has been for the numbers and rates of ectopic pregnancy to increase over the 20-year period, some variations were noted. These variations may represent temporary fluctuations in the data caused by changing survey methodology. However, the variability of the data, as indicated by wide confidence intervals, does not permit meaningful conclusions about year-to-year changes in the estimates of ectopic pregnancies, especially for the years 1988 and 1989.

Our data show that blacks and other minorities have consistently had a higher risk of ectopic pregnancy, across all age and region strata. Moreover, during 1988 and 1989 the risk of death associated with the complications of ectopic pregnancy was greater among blacks and other minorities than among whites. Several reports have suggested that blacks and other minorities tend to have less and later prenatal care than do white women (35), and, although ectopic pregnancies generally occur before the onset of regular prenatal care, such data may serve as markers for inadequate access to or use of appropriate preventive and curative health services.

Until the risk factors that lead to ectopic pregnancy are more fully understood, early detection and appropriate management will be the most effective means of reducing the morbidity and mortality associated with this condition (36,37). All women of reproductive age should be made aware of the risk of ectopic pregnancy so that they can seek early prenatal care. Special education programs and early access to care should be targeted for groups of women known to be at higher risk for this serious complication of pregnancy. Emergency-room personnel and other health-care providers should consider and rule out ectopic pregnancy when treating women of reproductive age who have symptoms associated with ectopic pregnancy.

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#### References

1. Pritchard JA, MacDonald PC, Gant NF. *Williams obstetrics*. 17th ed. Norwalk, CT: Appleton-Century Croft, 1985:423-38.
2. CDC. Ectopic pregnancy in the United States, 1970-1983. In: CDC surveillance summaries, August 1986. MMWR 1986;35(No. SS-2):29SS-37SS.
3. CDC. Ectopic pregnancy surveillance, United States, 1970-1985. In: CDC surveillance summaries, December 1988. MMWR 1988;37(No. SS-5):9SS-18SS.
4. CDC. Ectopic pregnancy surveillance, United States, 1970-1986. In: CDC surveillance summaries, September 1989. MMWR 1989;38(No. SS-2):1SS-10SS.
5. CDC. Ectopic pregnancy surveillance, United States, 1970-1987. In: CDC surveillance summaries, December 1990. MMWR 1990;39(No. SS-4):9SS-17SS.
6. CDC. Ectopic pregnancy—United States, 1988-1989. MMWR 1992;41:591-4.
7. National Center for Health Statistics, Graves EJ. Utilization of short-stay hospitals, United States: 1987 annual summary. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1989; DHHS publication no. (PHS)89-1760. (Vital and health statistics; series 13, no. 99).
8. National Center for Health Statistics, Graves EJ. National Hospital Discharge Survey, 1988. In: National Hospital Discharge Survey: annual summary, 1988. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC. (Vital and health statistics; series 13, no. 106: 1-2, 46-53).

9. National Center for Health Statistics, Graves EJ. National Hospital Discharge Survey, 1989. In: National Hospital Discharge Survey: annual summary, 1989. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC. (Vital and health statistics; series 13, no. 109: 1-2, 42-49).
10. National Center for Health Statistics. International classification of diseases, eighth revision, adapted for use in the United States. Washington, DC: US Department of Health, Education, and Welfare, Public Health Service, 1968; PHS publication no. 1693.
11. The Commission on Professional and Hospital Activities. International classification of diseases, ninth revision, clinical modification. Ann Arbor, MI: US Department of Health, Education, and Welfare, Public Health Service, 1978.
12. National Center for Health Statistics. Advance report of final natality statistics, 1987. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1989:38(suppl 3). (Monthly vital statistics report).
13. Bureau of the Census. Geographic identification code scheme; 1980 Census of Population and Housing: 3,10; PHC80-R5. Washington, DC: US Department of Commerce, Bureau of the Census, April 1983.
14. Levy PS, Lemeshow S. Sampling of population: methods and applications. New York: John Wiley and Sons, 1991.
15. Research Triangle Institute. SUDAAN user's manual, release 5.50, 1991.
16. National Center for Health Statistics. Annual summary of births, marriages, divorces, and deaths: United States, 1988. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1989:37(no. 13, 23). (Monthly vital statistics report).
17. National Center for Health Statistics. Annual summary of births, marriages, divorces, and deaths: United States, 1989. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1990:38(no. 13, 23). (Monthly vital statistics report).
18. Vermesh M. Conservative management of ectopic gestation. *Fertil Steril* 1989;51:559-67.
19. Stovall TG, Ling FW, Buster JE. Outpatient chemotherapy of unruptured ectopic pregnancy. *Fertil Steril* 1989;51:435-8.
20. Garcia AJ, Aubert JM, Sama J, Josimovich JB. Expectant management of presumed ectopic pregnancies. *Fertil Steril* 1987;48:395-400.
21. Stabile I, Grudzinskas JG. Ectopic pregnancy: a review of incidence, etiology, and diagnostic aspects. *Obstet Gynecol Surv* 1990;45:335-47.
22. Chow WH, Daling JR, Cates W Jr, Greenberg RS. Epidemiology of ectopic pregnancy. *Epidemiol Rev* 1987;9:70-94.
23. Kojima E, Abe Y, Morita M, Ito M, Hirakawa S, Momose K. The treatment of unruptured tubal pregnancy with intratubal methotrexate injection under laparoscopic control. *Obstet Gynecol* 1990;75:723-5.
24. Hallatt JG. Repeat ectopic pregnancy: a study of 123 consecutive cases. *Am J Obstet Gynecol* 1975;122:520-4.
25. Weckstein LN. Current perspective on ectopic pregnancy. *Obstet Gynecol Surv* 1985;40: 259-72.
26. Walters MD, Eddy CA, Gibbs RS, Schachter J, Holden AE, Pauerstein CJ. Antibodies to *Chlamydia trachomatis* and risk for tubal pregnancy. *Am J Obstet Gynecol* 1988;159:942-6.
27. Coste J, Job-Spira N, Fernandez H, Papiernik E, Spirà A. Risk factors for ectopic pregnancy: a case-control study in France, with special focus on infectious factors. *Am J Epidemiol* 1991;133:839-49.
28. Westrom L, Bengtsson LPH, Mardh PA. Incidence, trends, and risks of ectopic pregnancy in a population of women. *Br Med J* 1981;282:15-8.
29. Peterson HB, Chow WH, Atrash HK. Epidemiology of ectopic pregnancy in the United States. In: Fredericks CM, Paulson JD, Holtz G, eds. *Ectopic pregnancy: pathophysiology and clinical management*. New York: Hemisphere Publishing Corporation, 1989:1-26.
30. Campbell OM, Gray RH. Smoking and ectopic pregnancy: multinational case-control study. In: Rosenberg MJ, ed. *Smoking and reproductive health*. Littleton, MA: PSG Publishing Company, 1987:70-5.
31. Chow WH, Daling FJ, Weiss NS, Voigt LF. Maternal cigarette smoking and tubal pregnancy. *Obstet Gynecol* 1988;71:167-70.
32. Handler A, Davis F, Ferre C, Yeko T. The relationship of smoking and ectopic pregnancy. *Am J Public Health* 1989;79:1239-42.
33. DeCherney A. Ectopic pregnancy. *Clin Obstet Gynecol* 1987;30:155-63.

34. Tietze C, Henshaw SK. Induced abortion: a world review. New York: The Alan Guttmacher Institute, 1986.
35. National Center for Health Statistics. Health, United States, 1989. Hyattsville, MD: US Department of Health and Human Services, Public Health Service, CDC, 1989; DHHS publication no. (PHS)90-1232.
36. Leach RE, Ory SJ. Management of ectopic pregnancy. *Am Fam Physician* 1990;41:1215-22.
37. Ory SJ. New options for diagnosis and treatment of ectopic pregnancy. *JAMA* 1992;267:534-7.



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